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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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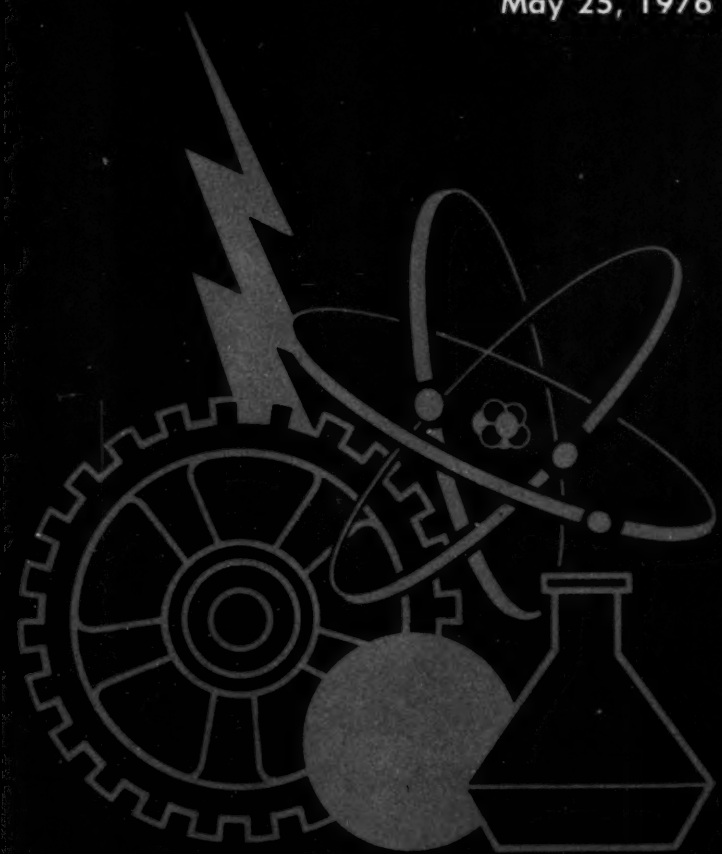

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TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

Chapter I—Patent and Trademark Office, Department of Commerce

PART 4—FORMS FOR TRADEMARK CASES

Revised Trademark Forms

The Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations by revising §§ 4.1, 4.1a, 4.2, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11, 4.13, 4.14, 4.15, 4.16, 4.17, 4.18, 4.19, 4.21 and 4.22, which sections are suggested forms for trademark cases, and also revising the introductory note to the Forms for Trademark Cases.

These revisions conform the language of the forms, where necessary, to the changes in Part 2 of this Chapter which became effective on February 1, 1976, and also alter language in the forms which is incorrect or inconsistent. These revisions do not effect any changes in practice and do not impose a burden on anyone, and therefore procedures for public comment are not deemed necessary.

The major revisions in the forms, aside from conformance of language to the present trademark rules, are described below:

A form of notarial jurat is included or incorporated by reference at the end of all verifications and affidavits. A form of acknowledgement is included at the end of the assignment of application form and the assignment of registration form.

A note is included to indicate where adjustment of a form is necessary to accommodate multiple classes or services.

Wording is included in section 4.2 to indicate that the form is for use only by attorneys at law and that submission of the form by attorneys at law is optional.

Notes to section 4.8 are included to explain how to use the form for collective membership marks in addition to collective trademarks and collective service marks.

The organization of section 4.13 (Application for renewal) has been changed to remove the statement as to use and the goods on which the mark is still in use from the verification portion of the form and to place the statements in the body of the application portion of the form.

A note is included, where appropriate, to indicate that when a domestic representative is required but is not designated when a document is filed, an unrevoked designation if one is already in the file will be regarded as the required designation.

Pursuant to the authority contained in section 41 of the Act of July 5, 1946 (60 Stat. 440; 15 U.S.C. 1123) as amended on January 2, 1975 (Pub. L. 93–596; 88 Stat. 1949), and in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6) as amended on October 5, 1971 (Pub. L. 92–132; 85 Stat. 364) and on January 2, 1975 (Pub. L. 93–596; 88 Stat. 1949), Part 4 of Chapter I of Title 37 of the Code of Federal Regulations is hereby revised, as follows:

NOTE: The following forms illustrate the manner of preparing applications for registration of marks as well as various other papers to be filed in the Patent and Trademark Office in trademark cases. Applicants and other parties will find their business facilitated by following them. These forms should be used in cases to which they are applicable. A sufficient number of representative forms are given which, with the variations indicated by the notes, should take care of all the usual situations. In special situations such alterations as the circumstances rendered necessary may be made provided they do not depart from the requirements of Part 2 of this Chapter or of the trademark statute. Before using any forms, the pertinent requirements of Part 2 of this Chapter and the pertinent sections of the trademark statute should be studied carefully.

In using these forms, the applicant or other party filing the form may, instead of making oath or verification where such is prescribed in the forms, set forth a written declaration that all statements made of his own knowledge are true and that all statements made on information and belief are believed to be true, but this may be done only if declarant is warned by wording in the same paper that willful false statements and the like are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and may jeopardize the validity of the application or other document or any registration resulting from the application: See form 4.1a.

Sec.

4.1 Trademark application by an individual; Principal Register with oath.
4.1a Trademark application by an individual; Principal Register with declaration.
4.2 Power of attorney at law (which may accompany application).
4.4 Designation of domestic representative to accompany application.
4.5 Trademark application by a firm; Principal Register.
4.6 Trademark application by a corporation; Principal Register.
4.7 Service mark application; Principal Register.
4.8 Collective mark application (including collective membership mark); Principal Register.
4.9 Certification mark application; Principal Register.
4.10 Application based on concurrent use; Principal Register.
4.11 Application to register on Supplemental Register.
4.13 Application for renewal.
4.14 Affidavit for publication under section 12(c).
4.15 Affidavit required by section 8.
4.16 Affidavit under section 15 (or combined sections 8 and 15).
4.17 Opposition in the United States Patent and Trademark Office.
4.18 Petition to cancel a registration in the United States Patent and Trademark Office.
4.19 Ex parte appeal from Examiner of Trademarks in the United States Patent and Trademark Office.
4.21 Assignment of application.
4.22 Assignment of registration.

AUTHORITY: The provisions of this Part 4 issued under secs. 1, 2, 7, 9, 12, 13, 14, 21, 23, 30, 44, 45, 60 Stat. 427, as amended, sec. 41 60 Stat. 440, sec. 6, 66 Stat. 793; 15 U.S.C. 1051, 1052, 1057, 1059, 1062, 1063, 1064, 1071, 1091, 1112, 1123, 1126, 1127; 35 U.S.C. 6, unless otherwise noted.

§ 4.1 *Trademark application by an individual; Principal Register with oath.*

Mark _____
(Identify the mark)

Class No. _____
(If known)

To the Commissioner of Patents and Trademarks:

_____
(Name of applicant, and trade style, if any)

_____
(Business address, including street, city and State)

_____
(Residence address, including street, city and State)

_____
(Citizenship of applicant)

The above identified applicant has adopted and is using the trademark shown in the accompanying drawing (1) for

_____
(Common, usual or ordinary name of goods)

and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the act of July 5, 1946.

The trademark was first use on the goods (2) on _____; (Date)
was first used in (3) _____ commerce on (Type of commerce)
_____; and is now in use in such commerce. (4) The (Date)
mark is used by applying it to (5) _____ and five specimens showing the mark as actually used are presented herewith.

(6)

State of _____ } ss.
County of _____ }

_____, being sworn, states that:
(Name of applicant)
he believes himself to be the owner of the trademark sought to be registered; to the best of his knowledge and belief no person, firm, corporation or association has the right to use said mark in commerce, either in the identical form or in such near resemblance thereto as to be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive; and the facts set forth in this application are true.

_____
(Signature of applicant)

Subscribed and sworn to before me, this _____ day of _____, 19---.

_____(*)
Notary Public

(*) (The jurat shall be in the form prescribed by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.)

REPRESENTATION

(See form 4.2 and Note (7) below.)

NOTES

(1) If registration is sought for a word or numeral mark not depicted in any special form, the drawing may be the mark typed in capital letters on letter-size bond paper; otherwise, the drawing shall comply with section 2.52.

(2) If more than one item in a class is set forth and the dates given for that class apply to only one of the items listed, insert the name of the item to which the dates apply.

(3) Type of commerce should be specified as "interstate," "territorial," "foreign," or other type of commerce which may lawfully be regulated by Congress. Foreign applicants relying upon use must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.

(4) If the mark is other than a coined, arbitrary or fanciful mark, and the mark is believed to have acquired a secondary meaning, insert whichever of the following paragraphs is applicable:

(a) The mark has become distinctive of applicant's goods as a result of substantially exclusive and continuous use in _____ commerce for the five years next
(Type of commerce)
preceding the date of filing of this application.

(b) The mark has become distinctive of applicant's goods as evidenced by the showing submitted separately.

(5) Insert the manner or method of using the mark with the goods, i.e., "the goods," "the containers for the goods," "displays associated with the goods," "tags or labels affixed to the goods," or other method which may be in use.

(6) The required fee of $35.00 for each class must be submitted.

(7) If the applicant is not domiciled in the United States, a domestic representative must be designated. See form 4.4.

§ 4.1a *Trademark application by an individual; Principal Register with declaration.*

Mark _____
(Identify the mark)
Class No. _____
(If known)

To the Commissioner of Patents and Trademarks:

_____
(Name of applicant, and trade style, if any)

_____
(Business address, including street, city and State)

_____
(Residence address, including street, city and state)

_____
(Citizenship of applicant)

The above identified applicant has adopted and is using the trademark shown in the accompanying drawing (1) for

_____
(Common, usual or ordinary name of goods)

and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the act of July 5, 1946.

The trademark was first used on the goods (2) on _____;
(Date)
was first used in (3) _____ commerce
(Type of commerce)
on _____; and is now in use in such commerce.
(Date)

(4) The mark is used by applying it to (5) _____ and five specimens showing the mark as actually used are presented herewith. (6) The undersigned applicant _____

_____
(Name of applicant)
declares: That he believes himself to be the owner of the trademark sought to be registered; that to the best of his knowledge and belief no other person, firm, corporation, or association has the right to use said mark in commerce, either in the identical form or in such near resemblance thereto as may be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive; that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or document or any registration resulting therefrom.

_____
(Signature of applicant)

_____
(Date)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES: See same numbered Notes under form 4.1.

§ 4.2 *Power of attorney at law (which may accompany application).*

Applicant hereby appoints (8) _____,
_____, an attorney at
(Address)
law or attorneys as law, to prosecute this application to register, to transact all business in the Patent and Trademark Office in connection therewith, and to receive the certificate of registration.

NOTE: (8) An individual attorney at law or individual attorneys at law must be named here. If the name of a law firm is given, it will be regarded merely as a designation of address for correspondence.

§ 4.4 *Designation of domestic representative to accompany application. (9)*

_____,
(Name of representative)
where postal address is _____,
(Street, city and State)
is hereby designated applicant's representative upon whom notices or process in proceedings affecting the mark may be served.

NOTE: (9) The designation of a domestic representative must be separate from a power of attorney at law or other authorization of representation.

§ 4.5 *Trademark application by a firm; Principal Register.*

Mark _____
(Identify the mark)
Class No. _____
(If known)

To the Commissioner of Patents and Trademarks:

_____
(Firm name and names of members comprising firm)

_____
(Business address, including street, city and State)

_____
(Domicile of firm)

_____
(Citizenship of members of firm)

(Body of application is same as in form 4.1).

State of _____ } ss.
County of _____ }

_____, being sworn,
(Name of member of firm)
states that he is a member of the applicant firm; he believes said firm to be the owner of the trademark sought to be registered; to the best of his knowledge and belief no other person, firm, corporation or association has the right to use said mark in commerce, either in the identical form or in such near resemblance thereto as to be likely, when applied to the goods of such other person, to cause confusion, or to

cause mistake, or to deceive; and the facts set forth in this application are true.

_____
(Signature of member of firm)

Subscribed and sworn to before me, this _____ day of _____, 19____.

_____(*)
Notary Public

(*) (The jurat shall be in the form prescribed by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

§ 4.6 *Trademark application by a corporation; Principal Register.*

Mark _____
(Identify the mark)

Class No. _____
(If known)

To the Commissioner of Patents and Trademarks:

_____
(Corporate name and State or country of incorporation) (10)

_____
(Business address, including street, city and State)

(Body of application is same as in form 4.1.)

State of _____ }
County of _____ } ss.

_____, being sworn,
(Name of corporate officer)

states that: he is _____ of applicant
(Official title)

corporation (10) and is authorized to execute this affidavit on behalf of said corporation; he believes said corporation to be the owner of the trademark sought to be registered; to the best of his knowledge and belief no other person, firm, corporation or association has the right to use said mark in commerce, either in the identical form or in such near resemblance thereto as to be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive; and the facts set forth in this application are true.

_____
(Corporate name)

By _____
(Signature of corporate officer and official title.)

Subscribed to and sworn to before me, this _____ day of _____, 19____.

_____(*)
Notary Public

(*) (The jurat shall be in the form prescribed by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTE: (10) If applicant is an association or other collective group, the word "association" or other appropriate designation should be substituted for "corporation" when referring to applicant.

§ 4.7 *Service mark application; Principal Register.*

Mark _____
(Identify the mark)

Class No. _____
(If known)

To the Commissioner of Patents and Trademarks:

(Insert appropriate identification of applicant in accordance with form 4.1, 4.5 or 4.6.)

The above identified applicant has adopted and is using the service mark shown in the accompanying drawing (11) for

_____
(Common, usual or ordinary name of service)

and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the act of July 5, 1946.

The service mark was first used in connection with the services (2) on _____; was first used in
(Date)

connection with the services rendered in (3) _____
(Type of commerce)

commerce on _____; and is now in use in
(Date)

such commerce. (4)

The mark is used by _____

_____
(State method of using the mark in connection with the services)

and five (12) _____ showing the mark as actually used are presented herewith.

(Insert appropriate verification or declaration from form 4.1, 4.1a, 4.5 or 4.6, changing the word "trademark" to "service mark" and the word "goods" to "services.")

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

For Notes referred to in this form but not set out here, see same numbered Notes under form 4.1.

(11) See Note (1) under form 4.1, and if drawing is not practicable, insert description of the mark instead of reference to the drawing.

(12) Insert "specimens," or state the nature of the representation of the mark which is furnished.

§ 4.8 *Collective mark application (including collective membership mark); Principal Register.*

Mark _____
(Identify the mark)

Class No. _____
(If known)

To the Commissioner of Patents and Trademarks:

(Insert identification of applicant in accordance with form 4.6.)

The above identified applicant has adopted and is exercising legitimate control over the use of the collective mark shown in the accompanying drawing (1) for (13) _____
(Common,

_____
usual or ordinary name of goods or services)

to indicate (14) _____ and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the act of July 5, 1946.

The collective mark was first used on the (2) _____

_____
(Insert "goods" or "services") (15)

by members of applicant on _____; was first
(Date)

used by said members in (3) _____
(Type of commerce)

commerce on _____; and is now in use in such
(Date)

commerce. (4)

The mark is used by applying it to (5) _____ and five specimens of the mark as actually used are presented herewith.

(Insert verification from form 4.6, changing "corporation" to "association" or the like, if necessary.)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

For Notes referred to in this form but not set out here, see same numbered Notes under form 4.1.

(13) If the application is for a membership mark, omit the word "for" and the space for the name of the goods or services.

(14) If the application is for a membership mark, insert "membership in applicant organization," or similar appropriate statement. If not for a membership mark, omit the words "to indicate" and the following space.

(15) If the application is for a membership mark, the phrase "on the goods or services" should be omitted.

§ 4.9 *Certification mark application; Principal Register.*

Mark _____
(Identify the mark)

Class No. _____
(If known)

To the Commissioner of Patents and Trademarks:

(Insert appropriate identification of applicant in accordance with form 4.1, 4.5, or 4.6.)

The above identified applicant has adopted and is exercising legitimate control over the use of the certification

mark shown in the accompanying drawing (1) for _____
(Insert illustrative examples of the goods or services)
and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the act of July 5, 1946.

The certification mark, as used by persons authorized by applicant, certifies (16) _____; said mark was first used under the authority of applicant on _____;
(Date)
was first used in (3) _____
(Type of commerce)
commerce on _____; and is now in use in such
(Date)
commerce. (4)

The mark is used by applying it to (5) _____, and five specimens showing the mark as actually used are presented herewith.

Applicant is not engaged in the production or marketing of any goods or services to which the mark is applied.

(Insert appropriate verification or declaration from form 4.1, 4.1a, 4.5 or 4.6, and add after the word "association" the words "other than those authorized by applicant.")

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

For Notes referred to in this form but not set out here, see same numbered Notes under form 4.1.

(16) Insert an appropriate statement as to what the mark certifies, relating to regional origin; or material, mode of manufacture, quality, accuracy or other characteristic of the goods; or that the work or labor on the goods or in the performance of the services was performed by members of applicant.

§ 4.10 *Application based on concurrent use; Principal Register.*

Mark _____
(Identify the mark)
Class No. _____
(If known)

To the Commissioner of Patents and Trademarks:

(Insert appropriate identification of applicant in accordance with form 4.1, 4.5 or 4.6.)

Use form 4.1, and add at the end of the first paragraph: "for the area comprising _____";
(List the states for which registration is sought)
and add as final paragraph of application:

The following exception(s) to applicant's right to exclusive use are:

By _____, doing business at _____, who is using the mark _____
(Identify mark and Reg. No. or Ser. No., if any)
for _____
(Common, usual, or ordinary name of goods or services)
in the States of _____
by applying the mark to (5) _____
from _____
(Earliest known date of such use)
to the present."

(Insert appropriate verification or declaration from form 4.1, 4.1a, 4.5 or 4.6 and add after the word "association" the words "other than specified in the application.")

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES: See same numbered Notes under form 4.1.

§ 4.11 *Application to register on Supplemental Register.*

Mark _____
(Identify the mark)
Class No. _____
(If known)

To the Commissioner of Patents and Trademarks:

(Insert appropriate identification of applicant in accordance with form 4.1, 4.5 or 4.6.)

For the body of an application for a trademark registration (17), use form 4.1, 4.5 or 4.6, whichever is appropriate, changing the word "Principal" to "Supplemental," and adding a final paragraph to the application as follows:

"The mark sought to be registered has been in lawful use in _____
(Type of commerce)
commerce in connection with the goods for the year preceding the date of filing of this application." (18)

(Insert appropriate verification or declaration from form 4.1, 4.1a, 4.5 or 4.6.)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

(17) For the body of service mark, collective mark or certification mark applications on the Supplemental Register, use form 4.7, 4.8 or 4.9, whichever is applicable, with the change and addition indicated in this form.

(18) If the mark has not been in use for the year next preceding the filing date, and registration in the United States is required as a basis for obtaining foreign protection of the mark, substitute the following statement for the last sentence: The mark sought to be registered is not in use in _____
(Type of commerce)
commerce and domestic registration is required as a basis for foreign protection of the mark.

In this instance applicant will be required to make a showing that U.S. registration is required as a basis of foreign protection of the mark.

§ 4.13 *Application for renewal.*

Mark _____
(Identify the mark)
Reg. No. _____
Class No. _____

To the Commissioner of Patents and Trademarks:

(Insert appropriate identification of applicant for renewal in accordance with form 4.1, 4.5 or 4.6.) (1)

The above identified applicant for renewal requests that the above identified registration, granted to _____
(Name of original registrant) on _____
(Date of Issuance)
which applicant for renewal now owns, as shown by records in the Patent and Trademark Office, be renewed in accordance with the provisions of section 9 of the act of July 5, 1946.

The mark shown in said registration is still in use in (2) _____
(Type of commerce)
commerce on each of the following goods (3) recited in the registration: _____, the attached specimen (or facsimile) showing the mark as currently used. (4)

(5)

State of _____ }
County of _____ } ss.

_____
(Name of renewal applicant or of person authorized to sign for renewal applicant)
being sworn, states that the applicant for renewal owns the above identified registration; and that to the best of his knowledge and belief the facts set forth in this application are true.

_____
(Signature of renewal applicant; if renewal applicant is a corporation or other juristic organization, give the official title of the person who signs for renewal applicant.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and Note (6) below.)

NOTES

(1) Applicant for renewal must be the present owner of the registration.

(2) Type of commerce should be specified as "interstate," "foreign," "territorial," or other type of commerce which may lawfully be regulated by Congress. Foreign registrants must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.

(3) If a service mark registration, state "in connection with each of the following services * * *."

(4) If the mark is not in use in commerce at the time of filing the application for renewal, but there is no intention to abandon the mark, facts must be recited to show that the nonuse is due to special circumstances. A specimen (or facsimile) illustrating use, or facts as to nonuse, must be submitted for each class sought to be renewed.

(5) The required fee for renewal sought prior to expiration is $25.00 for each class; and for delayed renewal filed within three months after expiration, an additional $5.00 for each class. If renewal is sought for less than the total number of classes in the registration, the classes for which renewal is sought should be specified.

(6) If applicant for renewal is not domiciled in the United States, a domestic representative must be designated. See form 4.4. If a designation is not made, an unrevoked designation will meet the requirement if such is already in the registration file.

§ 4.14 *Affidavit for publication under section 12(c).*

Mark _____
(Identify the mark)
Reg. No. _____
Date of issue _____
To: _____
(Name of original registrant)

State of _____ }
County of _____ } ss.

_____
(Name of registrant or of person authorized to sign for a juristic registrant)

being sworn, states that (1) _____
(Name of registrant)

owns the above identified registration, as shown by records in the Patent and Trademark Office; that said registration is now in force; that the mark shown therein is in use in (2)

_____
(Type of commerce)

commerce on each of the following goods (3) recited in the registration _____; and that the benefits of the act of July 5, 1946, are hereby claimed for said registration.

(4)

_____
(Signature; if a corporation or other juristic organization, give the official title of the person who signs.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and Note (5) below.)

NOTES

(1) The present owner of the registration must file the affidavit as registrant.

(2) Type of commerce should be specified as "interstate," "territorial," "foreign," or other type of commerce which may lawfully be regulated by Congress. Foreign registrants must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.

(3) If a service mark registration, state: "in connection with each of the following services."

(4) The required fee of $10.00 must be submitted.

(5) If registrant is not domiciled in the United States, a domestic representative must be designated. See form 4.4. If a designation is not made, an unrevoked designation will meet the requirement if such is already in the registration file.

§ 4.15 *Affidavit required by section 8.*

Mark _____
(Identify the mark)
Reg. No. _____
Class No. _____

State of _____ }
County of _____ } ss.

_____
(Name of registrant or of person authorized to sign for a juristic registrant)

being sworn, states that (1) _____
(Name of registrant)

owns the above identified registration issued _____
(Date)

(2), as shown by records in the Patent and Trademark Office; and that the mark shown therein is still in use (3) as evidenced by (4) _____

(5)

_____
(Signature; if a corporation or other juristic organization, give the official title of the person who signs.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and Note (6) below.)

NOTES

(1) The present owner of the registration must file the affidavit as registrant.

(2) If the registration issued under a prior act and has been published under section 12(c), add: "and published under section 12(c) on _____"
(Date)

(3) If the mark is not in use at the time of filing the affidavit, but there is no intention to abandon the mark, facts must be recited to show that the nonuse is due to special circumstances.

(4) Insert "the specimen included showing the mark as currently used," or recite facts as to sales or advertising which will show that the mark is in current use. Specimen illustrating use, or facts as to use or nonuse, are required for each class for which action is sought.

(5) The required fee of $10.00 must be submitted for each class for which action is sought, and if action is sought for less than the total number of classes in the registration, the classes for which action is sought should be specified.

(6) If registrant is not domiciled in the United States, a domestic representative must be designated. See form 4.4. If a designation is not made, an unrevoked designation will meet the requirement if such is already in the registration file.

§ 4.16 *Affidavit under section 15 (or combined sections 8 and 15).*

Mark _____
(Identify the mark)
Reg. No. _____
Class No. _____

State of _____ }
County of _____ } ss.

_____
(Name of registrant or of person authorized to sign for a juristic registrant)

being sworn, states that (1) _____
(Name of registrant)

owns the above identified registration issued _____
(Date)

(2), as shown by records in the Patent and Trademark Office; that the mark shown therein has been in continuous use in (3)

_____
(Type of commerce)

commerce for five consecutive years from (4) _____ to the
(Date)

present, on each of the following goods (5) recited in the registration: _____; that such
(List of Goods)

mark is still in use in (3) _____
(Type of commerce)

commerce; that there has been no final decision adverse to registrant's claim of ownership of such mark for such goods or services, or to registrant's right to register the same or to keep the same on the register, and that there is no proceeding involving said rights pending and not disposed of either in the Patent and Trademark Office or in the courts.

_____
(Signature; if a corporation or other juristic organization, give the official title of the person who signs.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See rule 4.2 and Note (6) below.)

NOTES

This form may be used as a combined affidavit under sections 8 and 15 provided it contains matter which will meet the requirements of section 8 as to use or nonuse and fee (see form 4.15, Notes (3), (4) and (5)).

(1) The present owner of the registration must file the affidavit as registrant.

(2) If the registration issued under a prior act and has been published under section 12(c), add: "and published under section 12(c) on _____ (Date)."

(3) Type of commerce must be specified as "interstate," "territorial," "foreign," or such other commerce as may lawfully be regulated by Congress. Foreign registrants must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.

(4) The date should be the beginning of a five year period of continuous use, all of which five year period falls after the date of registration under the act of 1946 or after the date of publication under section 12(c). A date which would produce a period of continuous use which is longer than five years may be stated provided the period indicated includes five years of continuous use after registration under the act of 1946 or publication under section 12(c).

(5) If a service mark registration, state: "in connection with each of the following services."

(6) If registrant is not domiciled in the United States, a domestic representative must be designated as to the section 8 affidavit. See form 4.4. If a designation is not made, an unrevoked designation will meet the requirement if such is already in the registration file.

§ 4.17 *Opposition in the United States Patent and Trademark Office.*

In the matter of application Serial No. _____
Published in the OFFICIAL GAZETTE on _____ (Date)

_____ (Name of opposer)

v.

_____ (Name of applicant)

Opposition No. _____ (To be inserted by Patent and Trademark Office)

_____, a(n) (1) _____, (Name of opposer) (Legal entity of opposer)
located and doing business at _____ (Street, city and State)
believes that he will be damaged by registration of the mark shown in the above identified application, and hereby opposes the same.

As grounds of opposition, it is alleged that:

(Numbered paragraphs should state the grounds and recite facts tending to show why opposer believes he will be damaged.)

(2)

_____ (Signature of opposer; if opposer is a corporation or other juristic organization, give the official title of the person who signs for opposer.)

State of _____ }
County of _____ } ss.

_____ (Name of opposer or of person authorized to sign for opposer)

being sworn, states that he is the opposer named in the foregoing opposition, or is the person authorized to sign for the opposer named in the foregoing opposition; that he has read and signed the opposition and knows the contents thereof; and that the allegations are true, except as to the matters stated therein to be upon information and belief, and as to those matters he believes them to be true.

_____ (Signature of opposer; if opposer is a corporation or other juristic organization, give the official title of the person who signs for opposer.)

(JURAT) (use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1. For opposers who are foreigners, it is customary to regard a power of attorney as the equivalent of a domestic representative.)

NOTES

(1) If an individual, state: "an individual," or "an individual trading as _____," if there is a trade style. If a partnership, state: "a partnership composed of _____ (Names of members)." If a corporation, association, or other organization, state "a corporation (or specify other type of organization) organized and existing under the laws of _____ (State or country)."

(2) The required fee of $25.00 must be submitted for each class to be opposed, and if opposition is sought for less than the total number of classes, the classes sought to be opposed should be specified.

§ 4.18 *Petition to cancel a registration in the United States Patent and Trademark Office.*

In the matter of Registration No. _____
Date of Issue _____

_____ (Name of petitioner)

v.

_____ (Name of registrant)

Cancellation No. _____ (To be inserted by Patent and Trademark Office)

_____, a(n) (1) _____, (Name of petitioner) (Legal entity of petitioner)
located and doing business at _____ (Street, city and State)
that he is or will be damaged by the above identified registration, and hereby petitions to cancel the same.

As grounds therefor, it is alleged that:

(Numbered paragraphs should state the grounds and recite facts tending to show why petitioner believes that he is or will be damaged.)

(2)

_____ (Signature of petitioner; if petitioner is a corporation or other juristic organization, give the official title of the person who signs for petitioner.)

State of _____ }
County of _____ } ss.

_____ (Name of petitioner or of person authorized to sign for petitioner)

being sworn, states that he is the petitioner named in the foregoing petition to cancel, or is the person authorized to sign for the petitioner named in the foregoing petition to cancel; that he has read and signed the petition to cancel and knows the contents thereof; and that the allegations are true, except as to the matters stated therein to be upon information and belief, and as to those matters he believes them to be true.

_____ (Signature of petitioner to cancel; if petitioner is a corporation or other juristic organization, give the official title of the person who signs for petitioner.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

See form 4.2 and Note (7) under form 4.1. For petitioners who are foreigners, it is customary to regard a power of attorney as the equivalent of a domestic representative.)

NOTES

(1) If an individual, state: "an individual," or "an individual trading as _____," if there is a trade style. If a partnership, state: "a partnership composed of _____ (Names of members)." If a corporation, association, or other organization, state "a corporation (or specify other type of organization) organized and existing under the laws of _____ (State or country)."

(2) The required fee of $25.00 must be submitted for each class sought to be cancelled. and if cancellation is sought for less than the total number of classes, the classes sought to be cancelled should be specified.

§ 4.19 *Ex parte appeal from Examiner of Trademarks in the United States Patent and Trademark Office.*

_____
(Name of applicant)

_____
(Serial number of application)

To the Trademark Trial and Appeal Board:

Applicant hereby appeals to the Trademark Trial and Appeal Board from the decision of the Examiner of Trademarks refusing registration.

_____
(Signature of applicant; if applicant is a corporation or other juristic organization, give the official title of the person who signs for applicant.)

§ 4.21 *Assignment of application.*

Whereas _____, of
(Name of assignor)

_____
(Street, city, and State)

has adopted and is using a mark for which he has filed application in the United States Patent and Trademark Office for registration, Serial No. _____; and

Whereas _____, of
(Name of assignee)

(1) _____,
(Street, city, and State)

is desirous of acquiring said mark;

Now, therefore, for good and valuable consideration, receipt of which is hereby acknowledged, said _____
(Name of assignor)

does hereby assign unto the said _____
(Name of assignee)

all rights, title and interest in and to the said mark, together with the good will of the business symbolized by the mark, and the above identified application for registration of said mark.

The Commissioner of Patents and Trademarks is requested to issue the certificate of registration to said assignee.

_____
(Signature of assignor; if assignor is a corporation or other juristic organization, give the official title of the person who signs for assignor.)

State of _____}
County of _____} ss.

On this _____ day of _____, 19____, before me appeared _____, the person who signed this instrument on his own behalf, or who was authorized to sign on behalf of the identified corporation or other juristic entity, who being sworn, acknowledged that he signed this instrument as a free act.

_____(*)
(Notary Public)

(*) (The acknowledgement shall be in the form prescribed by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.)

NOTES

(1) If the postal address of the assignee is not given either in the instrument or in an accompanying paper, registration to the assignee may be delayed.

(2) If assignee is not domiciled in the United States, a domestic representative must be designated. See Form 4.4.

§ 4.22 *Assignment of registration.*

Whereas _____, of
(Name of assignor)

_____
(Street, city, and State)

has adopted, used and is using a mark which is registered in the United States Patent and Trademark Office, Registration No. _____, dated _____; and

Whereas _____, of
(Name of assignee)

(1) _____,
(Street, city, and State)

is desirous of acquiring said mark and the registration thereof;

Now, therefore, for good and valuable consideration, receipt of which is hereby acknowledged, said _____
(Name of assignor)

does hereby assign unto the said _____
(Name of assignee)

all rights, title and interest in and to the said mark, together with the good will of the business symbolized by the mark, and the above identified registration thereof.

(2)

_____
(Signature of assignor; if assignor is a corporation or other juristic organization, give the official title of the person who signs for assignor.)

State of _____}
County of _____} ss.

On this _____ day of _____, 19____, before me appeared _____, the person who signed this instrument on his own behalf, or who was authorized to sign this instrument on behalf of the identified corporation or other juristic entity, who being sworn, acknowledged that he signed this instrument as a free act.

_____(*)
(Notary Public)

(*) (The acklowledgement shall be in the form prescribed by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction or execution, must be affixed.)

NOTES

(1) If the postal address of the asignee is not given either in the instrument or in an accompanying paper, recording may be delayed pending receipt of such address.

(2) If assignee is not domiciled in the United States, a domestic representative must be designated. See form 4.4.

Effective date: These revisions become effective on May 1, 1976.

Dated: April 6, 1976.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: April 22, 1976.

BETSY ANCKER-JOHNSON,
Assistant Secretary for Science and Technology.

[FR Doc. 76-12330; Filed 4-27-76; 8:45 am]

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,895,950, V. Krieble, COMPOSITIONS CONTAINING HYDROPEROXIDE POLYMERIZATION CATALYST AND ACRYLATE ACID DIESTER; **3,041,322**, same, ANAEROBIC CURING COMPOSITIONS CONTAINING ACRYLIC ACID DIESTERS; **3,046,262**, same, ACCELERATED ANAEROBIC CURING COMPOSITIONS, **filed** July 18, 1974, D.C., W.D. Tenn. (Memphis), Doc. C-74-395, *Loctite Corporation* v. *Accrabond Corporation and Landon Max Dula*. Ordered, adjudged and decreed, judgment is granted in favor of plaintiff. Plaintiff is the owner of U.S. patents and patents are valid and have been infringed. Defendants are hereby permanently enjoined. Nov. 28, 1975.

2,970,730, F. W. Schwarz, DICING SEMICONDUCTOR WAFERS; **3,442,725**, Huffman, Ehlenberger and McDonald, PHOSPHORUS DIFFUSION SYSTEM, **filed** Oct. 29, 1975, D.C., E.D. Pa. (Philadelphia), Doc. 75-3081, *Motorola Inc.* v. *MOS Technology Inc.*

2,980,982, Costa, Le Boeuf and Lefevre, FIBROUS ARTICLE; **3,214,899**, Wininger and Dyer, CORDAGE PRODUCT, **filed** Aug. 14, 1975, D.C., N.D. Ala. (Birmingham), Doc. CA 75-G-1445-E, *Eastman Kodak Company* v. *Wellington Fibres Incorporated*.

3,041,322. (See 2,895,950.)

3,046,262. (See 2,895,950.)

3,148,598, J. Davis, MAKING BAGS WITH ENCLOSED STIFFENER AT TOP; **Re. 26,675**, L. Canno, METHOD OF MAKING REINFORCED PLASTIC BAGS, **filed** Sept. 15, 1975, D.C., N.D. Ga. (Atlanta), Doc. C75-1785A, *Equitable Bag Co., Inc.* v. *Rexham Corporation*.

3,185,864, R. Kleist, DRIVE SYSTEM FOR TAPE TRANSPORT SYSTEM; **3,251,563,** Kleist and Wang, MAGNETIC TAPE TRANSPORT SYSTEM; **3,276,651,** Bryer, ROLLER GUIDE FOR WEB TRANSPORT MECHANISMS; **3,318,545,** R. Tobey, WEB TRANSPORT SYSTEM; **3,379,948,** M. Lewis, TAPE TRANSPORT DRIVE SYSTEM; **3,383,578,** same, CONTINUOUS MODE MOTOR SPEED CONTROL SPEED, **filed** Feb. 2, 1976, D.C., C.D. Calif. (Los Angeles), Doc. CV–0374–LTL, *Ampex Corporation* v. *Cipher Data Products Inc. and Computer Machinery Corporation.*

3,214,899. (See 2,980,982.)

2,231,785, A. Calabro, CIRCUIT BOARD MOUNTING DEVICE, **filed** Feb. 18, 1976, D.C.N.J. (Trenton), Doc. C–76–297, *Anthony D. Calabro* v. *Taurus Corp.*

3,251,563. (See 3,185,364.)

3,276,651. (See 3,185,364.)

3,318,545. (See 3,185,364.)

3,325,277, R. Huseby, METHOD OF MAKING METAL POWDER; **3,528,081,** Huseby and Garner, METHOD OF MAKING STEEL POWDER; **3,668,024,** M. Johnson, METHOD OF ANNEALING METAL POWDER; **3,687,654,** R. Huseby, METHOD OF MAKING ALLOY STEEL POWDER, **filed** July 10, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c1919, *A. O. Smith-Inland Corporation* v. *Hoeganaes Corporation.* Decision, for the reasons set forth in the memorandum decision defendant Hoeganaes Corporation's motion to dismiss the complaint for improper venue is granted, Jan. 12, 1976.

3,379,948. (See 3,185,364.)

3,383,578. (See 3,185,364.)

3,397,928, E. Galle, SEAL MEANS FOR DRILL BIT BEARINGS; **3,476,195,** same, LUBRICANT RELIEF VALVE FOR ROCK BITS; **Re. 28,625,** R. Cunningham, ROCK DRILL WITH INCREASED BEARING LIFE, **filed** Feb. 17, 1976, D.C., N.D. Tex. (Fort Worth), Doc. CA–4–76–53, *Hughes Tool Company* v. *Dresser Industries Inc.*

3,399,442, Jones and Greubel, CUTTING INSERT; **3,557,416,** D. Jones, same, **filed** Aug. 18, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c2778, *Kennametal Inc.* v. *Fansteel Inc.*

3,401,434, D. Daddona, SNAP FASTENER ASSEMBLY, **filed** Feb. 6, 1976, D.C., E.D. Ky. (Lexington), Doc. 76–3, *Scovill Manufacturing Company* v. *Textron Inc.*

3,432,451, R. Kales, POLYOLEFIN-MODIFIED POLYURETHANES AND PROCESS OF MAKING SAME, **filed** Feb. 11, 1976, D.C., E.D. Wis. (Milwaukee), Doc. 76–91, *J. M. Myers Tool Company* v. *Blair Industries Inc.*

3,442,725. (See 2,970,730.)

3,476,195. (See 3,397,928.)

3,510,471, L. Case, NOVEL POLYETHER POLYOLS AND PROCESS FOR PREPARING THE SAME, **filed** Mar. 4, 1975, D.C. (District of Columbia), Dec. 75–0292. *Leslie C. Case* v. *The Commissioner of Patents, Hyman M. Molotsky et al.* **Same, filed** Dec. 29, 1975, U.S. Court of Appeals, First Circuit, Massachusetts (Boston), Doc. 75–1493, *Leslie C. Case* v. *The Commissioner of Patents and Trademarks and CPC International Incorporated.*

3,524,023, S. Whang, BAND LIMITED TELEPHONE LINE DATA COMMUNICATION SYSTEM; **3,619,503,** R. Ragsdale, PHASE AND AMPLITUDE MODULATED MODEM; **3,643,023,** Ragsdale and Payne, DIFFERENTIAL PHASE MODULATOR AND DEMODULATOR UTILIZING RELATIVE PHASE DIFFERENCES AT THE CENTER OF THE MODULATION PERIODS; **3,783,194** V. Vilips, DATA MODEM HAVING A FAST TURN-AROUND TIME OVER DIRECT DISTANCE DIALED NETWORKS, **filed** Jan. 23, 1976, D.C. Kans. (Kansas City), Doc. 76–15–C2, *Milgo Electronic Corporation* v. *American Telephone and Telegraph Company et al.*

3,524,023, S. Whang, BAND LIMITED TELEPHONE LINE DATA COMMUNICATION SYSTEM; **3,619,503,** R. Ragsdale, PHASE AND AMPLITUDE MODULATED MODEM; **3,783,194,** V. Vilips, DATA MODEM HAVING A FAST TURN-AROUND TIME OVER DIRECT DISTANCE DIALED NETWORKS, **filed** Jan. 23, 1976, D.C. Kans. (Kansas City), Doc. 76–16–C2, *Milgo Electronic Corporation* v. *Yellow Freight System Inc.*

3,528,081. (See 3,325,277.)

3,528,124, Wenstrom and Gorton, METHOD OF SHUCKING SHELLFISH; **3,662,432,** same, APPARATUS FOR EVISCERATION SCALLOPS; **3,665,554,** same, METHOD OF EVISCERATION SHELLFISH, **filed** Dec. 19, 1975, D.C., M.D. Fla. (Orlando), Doc. 75–419–Orl–CR, *Slade Gorton and Company Inc.* v. *William R. Lambert, doing business as Southern Seafood Company.*

3,557,416. (See 3,399,442.)

3,560,998, R. S. Walton, ELECTRONICALLY CONTROLLED TIMEPIECE USING LOW POWER MOS TRANSISTOR CIRCUITY; **3,576,099,** same, SOLID STATE TIMEPIECE HAVING ELECTRO-OPTICAL TIME DISPLAY; **3,707,071,** same, SOLID STATE TIMEPIECE; **3,714,867,** B. Dargent, SOLID STATE WATCH INCORPORATING LARGE-SCALE INTEGRATED CIRCUITS; **3,759,031,** McCullough and Hougendobler, MODULAR SOLID STATE WRISTWATCH; **3,760,584,** B. Dargent, INTEGRATED CIRCUIT SOLID STATE WATCH; **3,803,827,** D. Roberts, SOLID STATE ELECTRONIC WRISTWATCH; **3,839,856,** B. Dargent, SOLID STATE WATCH WITH CALENDAR DISPLAY, **filed** Dec. 1, 1975, D.C., N.D. Calif. (San Francisco), Doc. C–75–2349 SW, *Time Computer Inc.* v. *Fairchild Camera and Instrument Corporation.*

3,576,099. (See 3,560,998.)

3,588,095, Ward, Ward and Bachmann. SUCTION TABLE SYSTEM FOR FEEDING OF WARPED SHEETS, **filed** July 24, 1972, D.C.N.J. (Camden), Doc. C–1256–72, *The Ward Machinery Company (formerly the Ward-Turner Machinery Co.)* v. *The Langston Company.* It is hereby adjudged, ordered and decreed as follows: The complaint herein is dismissed with prejudice. The answer and counterclaim, as amended, herein is dismissed with prejudice, Feb. 17, 1976.

3,619,503. (See 3,524,023.)

3,654,068, R. Muri, FLAME RETARDANT FIRE BARRIER LAMINATE; **3,694,305,** S. Munawwar, FLAME RETARDANT FIRE BARRIER COMPOSITION AND LAMINANT, **filed** Feb. 2, 1976. D.C.N.H. (Concord), Doc. 76–35, *Compac Corporation* v. *Nashua Corporation.*

3,662,124, Hassler and Wittkowski, DIRECTIONAL MICROPHONE FOR HEARING AID; **Re. 27,487,** O. Hassler, DIRECTIONAL HEARING AID, **filed** July 27, 1973, D.C. Ariz. (Phoenix), Doc. 73–466–Phx, *Textron Inc. et al.* v. *Royal Industries Inc.* Stipulated to and dismissed by the Court with prejudice, Feb. 3, 1976.

3,662,432. (See 3,528,124.)

3,665,554. (See 3,528,124.)

3,668,024. (See 3,325,277.)

3,694,305. (See 3,654,068.)

3,707,071. (See 3,560,998.)

3,714,867. (See 3,560,998.)

3,759,031. (See 3,560,998.)

3,760,584. (See 3,560,998.)

3,769,722, J. Rhee, PROTECTIVE SHOE; **3,855,633,** same, KARATE GLOVE; **3,903,546,** same, PROTECTIVE GLOVE FOR THE HAND, **filed** Nov. 28, 1975, D.C. Ind. (South Bend), Doc. S75–197, *Jhoon Goo Rhee* v. *H. H. Bremen Mfg. Co.* Judgment for plaintiff, against defendants permanently enjoined from directly or indirectly infringing said patents, Feb. 10, 1976.

3,783,194. (See 3,524,023.)

3,803,827. (See 3,560,998.)

3,810,267, Fussell and Maynard, BOAT WINDSHIELD MOUNTING MEANS; **3,829,153,** Fussell and Redmon, BRACE AND METHOD OF BRACING A WINDSHIELD TO A DASHBOARD, **filed** Jan. 30, 1976, D.C., M.D. Fla. (Orlando), Doc. 76–33–Orl–C–R, *Waterbonnet Inc.* v. *Spenco Incorporated.*

3,829,153. (See 3,810,267.)

3,831,553, R. Thettu, WICK FOR OIL DISPENSING APPARATUS **D. 232,144,** J. Ford, SHELF SPINDLE, **filed** Sept. 11, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3030, *Kirsch Company* v. *Edgecraft Corporation et al.* Ordered, summary

judgment is entered in favor of said defendant, and the above cause is ordered dismissed, Feb. 24, 1976.

3,837,292, D. Wiebe, HYDRAULIC TRUCK SNUBBER, **filed** Apr. 21, 1975, D.C. W.D. Pa. (Pittsburgh), Doc. 75-482-C.A., *A. Stucki Company* v. *Railroad Dyamics Inc.* **Same, filed** Feb. 24, 1976, D.C., W.D. Pa. (Pittsburgh), Doc. 76-247, *A. Stucki Company* v. *Bethlehem Steel Corporation.*

3,838,437, H. Hamm, PHOTOGRAPHIC LENS ADAPTER RING FOR INTERCHANGEABLE LENSES, **filed** Oct. 30, 1975, D.C.N.J. (Newark), Doc. 75-1868, *Jerome R. Fund* v. *Rollei of America et al.* Order of dismissal of complaint, Feb. 19, 1976.

3,839,856. (See 3,560,908.)

3,855,633. (See 3,769,722.)

3,855,633, J. Rhee, KARATE GLOVE; **3,903,546,** same, PROTECTIVE GLOVE FOR THE HAND, **filed** Oct. 24, 1975, D.C., E.D. Wis. (Milwaukee), Doc. 75-619, *Jhoon Goo Rhee* v. *Judo-Karate Inc. and Norman Miller.*

3,857,566, J. Lemelson, ADHESIVE SURFACE DART AND SHOCK ASORBING TARGET; **3,917,271,** Lemelson and Elfman, BALL FOR TARGET GAMES, **filed** Jan. 19, 1976, D.C., C.D. Calif. (Los Angeles), Doc. CV-76-207, *Synergistics Research Corp.* v. *The May Department Stores Co. et al.* **Same, filed** Jan. 21, 1976, D.C., C.D. Calif. (Los Angeles), Doc. CV-76-247-WMB, *Synergistics Research Corp.* v. *John N. Hansen Company Inc. and Reps West.*

3,897,854. (See 3,325,277.)

3,903,546. See 3,769,722.)

3,917,271. (See 3,857,566.)

Re. 26,075. (See 3,148,598.)

Re. 27,487. (See 3,662,124.)

Re. 28,625. (See 3,397,928.)

D. 232,144. (See 3,831,553.)

D. 237,121, M. Metzner, TOOL CHEST OR SIMILAR ARTICLE, **filed** Feb. 10, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c486, *Glovemakers Inc.* v. *Harben Co., etc.*

PATENT NOTICES

Certificates of Correction for the Week of May 25, 1976

P.P. 3,828	3,887,497	3,922,201	3,932,534
Re. 28,077	3,887,682	3,922,518	3,932,589
Re. 28,623	3,888,548	3,923,511	3,933,332
D. 238,961	3,889,005	3,923,994	3,933,436
3,381,505	3,889,236	3,924,007	3,935,105
3,635,236	3,890,120	3,924,589	3,935,126
3,750,108	3,890,131	3,924,942	3,935,167
3,760,296	3,890,634	3,925,469	3,935,639
3,763,139	3,891,424	3,925,498	3,935,708
3,763,340	3,895,116	3,925,542	3,936,466
3,775,310	3,897,709	3,925,729	3,936,515
3,797,255	3,898,442	3,926,007	3,936,899
3,800,712	3,903,987	3,926,541	3,937,033
3,808,672	3,906,712	3,926,625	3,937,434
3,812,314	3,907,620	3,926,639	3,937,580
3,812,328	3,907,796	3,927,214	3,937,591
3,812,366	3,907,806	3,927,308	3,937,908
3,818,127	3,907,896	3,927,653	3,937,938
3,823,008	3,909,777	3,928,139	3,938,503
3,827,760	3,910,838	3,928,668	3,938,593
3,843,956	3,911,716	3,928,699	3,939,015
3,846,400	3,912,717	3,929,058	3,939,109
3,846,992	3,912,785	3,929,734	3,939,121
3,847,215	3,913,411	3,929,892	3,939,352
3,853,184	3,913,795	3,930,099	3,939,432
3,855,263	3,913,817	3,930,963	3,939,564
3,856,097	3,914,265	3,931,136	3,939,999
3,858,797	3,914,751	3,931,207	3,940,262
3,868,417	3,916,500	3,931,255	3,940,906
3,869,084	3,916,978	3,931,305	3,941,584
3,869,541	3,917,118	3,931,380	3,941,840
3,869,932	3,917,661	3,931,456	3,942,223
3,871,490	3,918,300	3,931,622	3,943,625
3,873,526	3,919,218	3,931,806	3,943,910
3,876,947	3,919,583	3,931,879	3,943,956
3,878,580	3,919,707	3,932,256	3,944,151
3,879,529	3,920,622	3,932,404	3,944,162
3,879,929	3,920,754	3,932,443	3,944,827
3,885,392	3,921,290	3,932,496	

Erratum

All reference to Patent No. 3,953,204 to Gerhard P. Klein of Massachusetts for Method of Making an Anode appearing in the OFFICIAL GAZETTE of April 27, 1976, should be deleted since no patent was granted.

Disclaimer and Dedication

3,932,622.—*Herman H. Friedman*, Bayside, and *Linda K. Halik*, Ossining, N.Y., and *Milton H. Schwarz*, Westport, Conn. SKIN MOISTURIZER. Patent dated Jan. 13, 1976. Disclaimer and dedication filed Mar. 31, 1976, by the assignee, *General Foods Corporation*.

Hereby disclaims and dedicates the entire term of said patent to the Public.

Disclaimers

Reissue 26,781.—*Carl J. Frenzel*, Chicago, Ill. TRIGGER ACTUATED SWITCH DEVICE. Patent dated Feb. 3, 1970. Disclaimer filed May 21, 1976, by the assignee, *Skil Corporation*.

Hereby enters this disclaimer to claims 1 through 7, inclusive, and 11 through 14, inclusive of said patent.

3,195,345.—*Tom N. Thiele*, Oconomowoc, Wis. THERMOELECTRIC DEWPOINT DETERMINING SYSTEM. Patent dated July 20, 1965. Disclaimer filed Feb. 11, 1976, by the assignee, EG & G, Inc.

Hereby enters this disclaimer to claims 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 15 and 16 of said patent.

3,537,403.—*Kristupas Daugirdas, Wilmette*, and *Charles J. Jechort, Jr.*, Berwyn, Ill. DOOR OPERATOR. Patent dated Nov. 3, 1970. Disclaimer filed Mar. 4, 1976, by the assignee, *Vapor Corporation*.

Hereby enters this disclaimer to all claims of said patent.

3,661,333.—*Leward N. Smith*, Remus, Mich. TREE DESTROYER. Patent dated May 9, 1972. Disclaimer filed Mar. 24, 1976, by the assignee, *Morbark Industries, Inc.*

Hereby enters this disclaimer to claims 1–3, 7–12, 14–16, 18, 19, 34, 35, 38 and 39 of said patent.

3,787,968.—*David Littmann*, Needham Township, Norfolk County, Mass. SEGMENT CUTTER. Patent dated Jan. 29, 1974. Disclaimer filed Mar. 23, 1976, by the assignee, *Minnesota Mining and Manufacturing Company*.

Hereby enters this disclaimer to claims 1 through 3 of said patent.

3,859,565.—*Lee A. Henningsen*, Erie, Pa. FIRE PUMP CONTROL APPARATUS. Patent dated Jan. 7, 1975. Disclaimer filed Mar. 8, 1976, by the assignee, *Firetrol, Inc.*

Hereby enters this disclaimer to claims 1, 2, 11, 12 and 14 of said patent.

3,862,159.—*Hamao Umezawa* and *Tomio Takeuchi*, Tokyo, *Koichi Miyano*, Omiya, *Hiroaki Hamano*, Higashi-Murayama, and *Wataru Tanaka*, Hoya, Japan. 5-(HALOALKYL)PICOLINIC ACID AND DERIVATIVES. Patent dated Jan. 21, 1975. Disclaimer filed Mar. 19, 1976, by the assignee, *Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai*.

Hereby enters this disclaimer to claim 1 of said patent.

3,940,250.—*Chris J. Plakas*, Washington, D.C., and *George S. Glaros*, Perama-Piraeus, Greece. TESTING USING LUMINESCENT REACTION. Patent dated Feb. 24, 1975. Disclaimer filed Feb. 13, 1976, by the assignee, *Vitatect Corporation*.

Hereby enters this disclaimer to claim 2 of said patent.

3,947,840. *Magnus George Craford*, St. Louis, and *Paul T. Bailey*, Creve Coeur, Mo. INTEGRATED SEMICONDUCTOR LIGHT-EMITTING DISPLAY ARRAY. Patent dated Mar. 30, 1976. Disclaimer filed Mar. 3, 1976, by the assignee, *Monsanto Company*.

The term of this patent subsequent to Feb. 24, 1993, has been disclaimed.

Dedications

Design No. 206,382.—*Donald A. Moore*, Los Gotos, Calif. MAGNETIC DISK STORAGE CARTRIDGE. Patent dated Dec. 6, 1966. Dedication filed Mar. 18, 1976, by the assignee, *International Business Machines Corporation*.

Hereby dedicates to the People of the United States, the remaining term of said patent.

3,235,180.—*Marvin M. Graham*, San Pedro, *John W. Wright*, Long Beach, and *Henry G. Braucksiek*, Buena Park, Calif. COMBINATION PRESSURE AND TEMPERATURE CONTROL. Patent dated Feb. 15, 1966. Dedication filed Mar. 19, 1976, by the assignee, *Robertshaw Controls Company*.

Hereby dedicates to the Public the remaining term of said patent.

3,338,519.—*Kenneth G. Kreuter,* Goshen, and *James W. Phillips,* South Bend, Ind. ZONE LOAD RESPONSIVE OPTIMIZING CONTROL SYSTEM. Patent dated Aug. 29, 1967. Dedication filed Mar. 18, 1976, by the assignee, *Robertshaw Controls Company.*

Hereby dedicates to the Public the remaining term of said patent.

3,485,706.—*Franklin James Evans,* Wilmington, Del. TEXTILE-LIKE PATTERNED NONWOVEN FABRICS AND THEIR PRODUCTION. Patent dated Dec. 23, 1969. Dedication filed Mar. 29, 1976, by the assignee, *E. I. du Pont de Nemours and Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,486,168.—*Franklin James Evans* and *Ronald John Summers,* Wilmington, Del. TANGLELACED NON-WOVEN FABRIC AND METHOD OF PRODUCING SAME. Patent dated Dec. 23, 1969. Dedication filed Mar. 29, 1976, by the assignee, *E. I. du Pont de Nemours and Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,493,462.—*William Wallar Bunting, Jr., Franklin James Evans,* and *David Ellis Hook,* Wilmington, Del. NONPATTERNED, NONWOVEN FABRIC. Patent dated Feb. 3, 1970. Dedication filed Mar. 29, 1976, by the assignee, *E. I. du Pont de Nemours and Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,494,821.—*Franklin James Evans,* Wilmington, Del. PATTERNED NONWOVEN FABRIC OF HYDRAULICALLY ENTANGLED TEXTILE FIBERS AND REINFORCING FIBERS. Patent dated Feb. 10, 1970. Dedication filed Mar. 29, 1976, by the assignee, *E. I. du Pont de Nemours and Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,508,308.—*William Wallar Bunting, Jr., Franklin James Evans,* and *David Ellis Hook,* Wilmington, Del. JET-TREATMENT PROCESS FOR PRODUCING NONPATTERNED AND LINE-ENTANGLED NONWOVEN FABRICS. Patent dated Apr. 28, 1970. Dedication filed Mar. 29, 1976, by the assignee, *E. I. du Pont de Nemours and Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

National Technical Information Service

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Copies of the patent applications, either paper copy (PC) or microfiche (MF), can be purchased at the prices cited from the National Technical Information Service (NTIS), Springfield, Va. 22161. Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, Washington, D.C. 20314

Patent application 488,084. System for Electronic Adjustment of Effective Contrast Ratio in Photographic Reproduction. Filed July 12, 1974. PC $3.50/MF $2.25.

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Patent 3,898,661. Mini-Regenerator. Filed Nov. 29, 1973. Patented Aug. 5, 1975. Not available NTIS.

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Research Agreements and Patent Mgmt. Branch, General Services Division, Federal Bldg., Agricultural Research Service, Hyattsville, Md. 20782

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U.S. DEPARTMENT OF TRANSPORTATION

Patent Counsel, 400 7th St. S.W., Washington, D.C. 20590

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health,, Chief, Patent Branch, Westwood Bldg., Bethesda, Md. 20014

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Branch of Patents, 18th and C Sts. NW., Washington, D.C. 20240

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U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research, Code 302, Arlington, Va. 22217

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Patent 3,869,648. Suppressor of Fast High Power Electrical Transients. Filed Oct. 19, 1973. Patented Mar. 4, 1975. Not available NTIS.

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Patent 3,879,637. Television Camera. Filed Mar. 22, 1972. Patented Apr. 22, 1975. Not available NTIS.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—Code GP-2, Washington, D.C. 20546

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U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

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Patent 3,902,092. Vibration Resistant Geiger-Mueller Tube. Filed Apr. 11, 1974. Patented Aug. 26, 1975. Not available NTIS.

Patent 3,902,176. Atmospheric Probe System for Passive Telemetry. Filed Nov. 27, 1973. Patented Aug. 26, 1975. Not available NTIS.

Patent 3,910,189. Deployment of Conductors Into the Atmosphere. Filed Mar. 25, 1974. Patented Oct. 7, 1975. Not available NTIS.

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U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Mgmt. Branch, General Services Division, Federal Bldg., Agricultural Research Service, Hyattsville, Md. 20782

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Patent 3,869,438. Process for Isolating Oil-Seed Proteins Using Liquid Fluorocarbons. Filed May 20, 1974. Patented Mar. 4, 1975. Not available NTIS.

U.S. DEPARTMENT OF TRANSPORTATION

Patent Counsel, 400 7th St. SW., Washington, D.C. 20590

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U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts. NW., Washington, D.C. 20240

Patent application 644,265. Sampling Method and Apparatus. Filed Dec. 24, 1975. PC $3.50/MF $2.25.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research, Code 302, Arlington, Va. 22217

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U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Mgmt. Branch, General Services Division, Federal Bldg., Agricultural Research Service, Hyattsville, Md. 20782

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Patent 3,725,442. Copolymers of Vinyl Monomers and Polyesters. Filed Apr. 9, 1970. Patented Apr. 3, 1973. Not available NTIS.

Patent 3,736,231. Preparation of Insolubilized Enzymes. Filed Nov. 1, 1971. Patented May 29, 1973. Not available NTIS.

Patent 3,745,218. Preservation Process Using 2-(4-Hydroxy-Phenyl)-Benzofuran. Filed Mar. 26, 1971. Patented July 10, 1973. Not available NTIS.

Patent 3,746,858. Shrinkproofing of Wool by Low Temperature Plasma Treatment. Filed Dec. 21, 1971. Patented July 17, 1973. Not available NTIS.

Patent 3,749,553. Modification of Wool With Vinyl-Pyridine and Zinc Chloride. Filed Dec. 1, 1971. Patented July 31, 1973. Not available NTIS.

Patent 3,766,261. Process of Producing Kynurenine. Filed July 14, 1972. Patented Oct. 16, 1973. Not available NTIS.

Patent 3,770,452. Beverages Containing Deamidized Gluten. Filed May 8, 1972. Patented Nov. 6, 1973. Not available NTIS.

Patent 3,775,540. Cinnamyl Phenols Useful as Antimicrobial Agents. Filed Oct. 31, 1972. Patented Nov. 27, 1973. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts. NW.,
Washington, D.C. 20240

Patent application 627,810. Thin Cell Electromembrane Separator. Filed Oct. 31, 1975. PC $3.50/MF $2.25.

Patent application 627,811. Parachute-Type Mine Stopping. Filed Oct. 31, 1975. PC $3.50/MF $2.25.

Patent application 629,270. Coordinated Color Chart System, and Method for Producing Same. Filed Nov. 6, 1975. PC $3.50/MF $2.25.

Patent application 633,139. Intermediate Drive for Belt Conveyor With Center Vertebrae. Filed Nov. 18, 1975. PC $3.50/MF $2.25.

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Patent application 639,024. Removal of Iron From Aluminum Nitrate. Filed Dec. 9, 1975. PC $3.50/MF $2.25.

Patent 3,920,403. Method of Desorbing Gold From Activated Carbon. Filed Feb. 1, 1974. Patented Nov. 18, 1975. Not available NTIS.

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Patent 3,926,799. Support for Dynamic Membrane. Filed Sept. 24, 1974. Patented Dec. 16, 1975. Not available NTIS.

Patent 3,927,719. Remote Sealing of Mine Passages. Filed Apr. 25, 1975. Patented Dec. 23, 1975. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research,
Code 302, Arlington, Va. 22217

Patent application 500,206. Directional Low-Frequency Ring Hydrophone. Filed Aug. 23, 1974. PC $3.50/MF $2.25.

Patent application 509,755. Complex Filters, Convolvers, and Multipliers. Filed Sept. 27, 1974. PC $3.50/MF $2.25.

Patent application 544,464. Technique for Detecting Energy and Determining the Frequency of Constituent Energy Components. Filed Jan. 27, 1975. PC $3.50/MF $2.25.

Patent application 594,415. Low-Cost Radar Processor. Filed July 9, 1975. PC $3.50/MF $2.25.

Patent application 622,924. An RF Signal Generator. Filed Oct. 16, 1975. PC $3.50/MF $2.25.

Patent application 622,925. FM RF Signal Generator Using Step Recovery Diode. Filed Oct. 16, 1975. PC $3.50/MF $2.25.

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Patent 3,881,559. Method for Stress Wave Drilling. Filed July 10, 1974. Patented May 6, 1975. Not available NTIS.

Patent 3,881,776. Vermiculating Polytoroidal Thruster. Filed Nov. 23, 1973. Patented May 6, 1975. Not available NTIS.

Patent 3,883,070. Method and Apparatus for Aiding in Solution of Three-Dimensional Fire Control Problems. Filed Apr. 23, 1964. Patented May 13, 1975. Not available NTIS.

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters, NASA—
Code GP–2, Washington, D.C. 20546

Patent application 625,732. Spring Operated Accelerator and Constant Force Spring Mechanism Therefor. Filed Oct. 24, 1975. PC $4.00/MF $2.25.

Patent application 625,781. Capacitive Shaft Encoder. Filed Oct. 24, 1975. PC $3.50/MF $2.25.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, Washington, D.C. 20314

Patent application 544,456. Extendable Rocket Motor Exhaust Nozzle. Filed Jan. 27, 1975. PC $3.25/MF $2.25.

Patent application 544,457. Pressure Sensitive Regulation Valve. Filed Jan. 27, 1975. PC $3.25/MF $2.25.

Patent application 547,662. Calibrated Quadraxial System for Measuring Shielding Transfer Impedance. Filed Feb. 6, 1975. PC $3.25/MF $2.25.

Patent application 547,663. Quartz Wedge Polarizer for an Electro Optic Switch. Filed Feb. 6, 1975. PC $3.25/MF $2.25.

Patent application 547,664. Tubular Regenerator for a Cryogenic Refrigerator. Filed Feb. 6, 1975. PC $3.25/MF $2.25.

Patent application 547,855. Mirror Steering System. Filed Feb. 6, 1975. PC $3.25/MF $2.25.

Patent application 550,091. Power Line Alarm System. Filed Feb. 14, 1975. PC $3.25/MF $2.25.

Patent application 550,781. Radioactively Preionized Electrical Discharge Laser. Filed Feb. 18, 1975. PC $3.25/MF $2.25.

Patent application 550,092. Universal Temperature Controlled Reference Junction. Filed Feb. 14, 1975. PC $3.25/MF $2.25.

Patent application 551,197. Method for Modifying Lattice Parameters. Filed Feb. 19, 1975. PC $3.25/MF $2.25.

Patent application 553,700. Thermal Switch. Filed Feb. 27, 1975. PC $3.25/MF $2.25.

Patent application 553,701. Poly(Perfluoroalkylene Oxide) Oxadiazoles and Their Synthesis. Filed Feb. 27, 1975. PC $3.75/MF $2.25.

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Patent application 556,988. Plasma Deposited Rider Rings for Hot Displacer. Filed Mar. 10, 1975. PC $3.25/MF $2.25.

Patent application 556,989. Dual Function Laser for Space Laser Communications. Filed Mar. 10, 1975. PC $3.25/MF $2.25.

Patent application 557,419. Tension Indicator-Turnbuckle. Filed Mar. 11, 1975. PC $3.25/MF $2.25.

Patent application 557,570. Reverse Flow Aft Inlet Ramjet System. Filed Mar. 11, 1975. PC $3.75/MF $2.25.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Mgmt. Branch, General Services Division, Federal Bldg., Agricultural Research Service, Hyattsville, Md. 20782

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Patent 3,801,649. Hydroxymethylated Derivatives of Resin Acids. Filed Mar. 15, 1972. Patented Apr. 2, 1974. Not available NTIS.

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Patent 3,811,210. Mild Cure Finishing Process Incorporating Improved Catalyst Systems to Produce Wrinkle Resistant, Durably Pressed and Creased Cellulosic Textile Products. Filed Jan. 26, 1972. Patented May 21, 1974. Not available NTIS.

U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

Assistant General Counsel for Patents Washington, D.C. 20545

Patent application 509,972. Secondary Lift for Magnetically Levitated Vehicles. Filed Sept. 27, 1974. PC $3.25/MF $2.25.

Patent application 512,810. Fission Fragment Excited Laser System. Filed Oct. 4, 1974. PC $3.25/MF $2.25.

Patent application 514,876. Flash Hydrogenation of Coal. Filed Oct. 15, 1974. PC $3.25/MF $2.25.

Patent application 519,324. Differential Auger Spectrometry. Filed Oct. 30, 1974. PC $3.25/MF $2.25.

Patent 3,852,407. Method for Removing Alkyl Iodides From Air by Mercuric Nitrate Solution. Filed Aug. 8, 1972. Patented Dec. 3, 1974. Not available NTIS.

Patent 3,853,700. Carbon-Trap Alloys for Liquid Sodium. Filed Nov. 2, 1973. Patented Dec. 10, 1974. Not available NTIS.

Patent 3,853,979. Method for Removing Rare Earths From Spent Molten Metallic Fluoride Salt Mixtures. Filed Aug. 14, 1972. Patented Dec. 10, 1974. Not available NTIS.

Patent 3,854,337. Charge Storage Device. Filed Oct. 1, 1973. Patented Dec. 17, 1974. Not available NTIS.

Patent 3,854,508. Automated Sample-Reagent Loader. Filed Apr. 13, 1973. Patented Dec. 17, 1974. Not available NTIS.

Patent 3,854,524. Thermal Switch-Heat Pipe. Filed Sept. 7, 1972. Patented Dec. 17, 1974. Not available NTIS.

Patent 3,854,792. Fiber Optic Security Seal. Filed Mar. 22, 1973. Patented Dec. 17, 1974. Not available NTIS.

Patent 3,856,335. Rolling Diaphragm Slip Joint. Filed Nov. 16, 1973. Patented Dec. 24, 1974. Not available NTIS.

Patent 3,857,070. Single-Lamp Ground Detector for Converter-Inverter Power Supplies. Filed Sept. 7, 1973. Patented Dec. 24, 1974. Not available NTIS.

Patent 3,857,913. Method for the Manufacture of Carbon Foam. Filed Oct. 13, 1972. Patented Dec. 13, 1974. Not available NTIS.

Patent 3,859,165. Epithermal to Intermediate Spectrum Pressurized Heavy Water Breeder Reactor. Filed Oct. 13, 1972. Patented Jan. 7, 1975. Not available NTIS.

Patent 3,860,691. Actinide Mononitride Microspheres and Process. Filed Jan. 14, 1975. Patented Jan. 14, 1975. Not available NTIS.

Patent 3,861,155. Pumpable Rockbolt Method. Filed Dec. 5, 1972. Patented Jan. 21, 1975. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts. NW., Washington, D.C. 20240

Patent application 191,818. Production of Fish Protein Concentrate. Filed Oct. 19, 1971. PC $3.25/MF $2.25.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research, Code 302, Arlington, Va. 22217

Patent application 385,528. Stable Free-Radical Structures. Filed Aug. 3, 1973. MF $2.25.

Patent application 554,360. Catalysts for Chemiluminescent Systems. Filed Mar. 3, 1975. PC $3.25/MF $2.25.

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Patent application 558,194. Use of High Energy Propellant in Gas Generator. Filed Mar. 13, 1975. PC $3.25/MF $2.25.

Patent application 559,944. Method for Driving a LED at High Speed. Filed Mar. 10, 1975. PC $3.25/MF $2.25.

Patent application 560,076. Partial Decomposition for Ablative Combustor Liners for Service Aeroheating Environments. Filed Mar. 20, 1975. PC $3.25/MF $2.25.

Patent application 560,077. Powder Barrier Bonding Technique. Filed Mar. 20, 1975. PC $3.25/MF $2.25.

Patent application 563,748. Warhead Casing. Filed Mar. 31, 1975. PC $3.25/MF $2.25.

Patent application 563,751. Method and System for Locating Breaks. Filed Mar. 31, 1975. PC $3.25/MF $2.25.

Patent application 563,936. Automatic Threshold Circuit. Filed Mar. 31, 1975. PC $3.25/MF $2.25.

Patent application 565,486. An Integrated Electro-Absorptive Light Modulator/Detector. Filed Apr. 7, 1975. PC $3.25/MF $2.25.

Patent application 565,496. Laser Diode Modulator Using Intergrated Optics. Filed Apr. 7, 1975. PC $3.25/MF $2.25.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA—Code GP–2, Washington, D.C. 20546

Patent application 566,495. Frequency Modulated Oscillator. Filed Apr. 9, 1975. PC $3.25/MF $2.25.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 24, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds: Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-15-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur: Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones: Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	7-7-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-14-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products: Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures: Special Utility Compositions: Bleaching; Dyeing and Photography.	6-2-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-21-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization: General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination: Horology; Acoustics; Recorders; Weighing Scales.	3-10-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-23-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-22-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-24-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-16-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-10-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-19-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	10-1-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-13-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-15-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-2-75

Expiration of patents: The patents within the range of numbers indicated below expire during May 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,894,634 to 2,588,678 inclusive
Plant Patents..... Numbers 1,829 to 1,837 inclusive

REISSUES

MAY 25, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,824

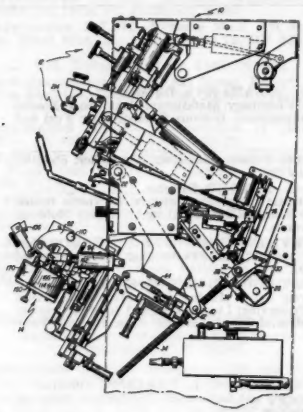
LASTING APPARATUS WITH YIELDABLE WIPING MEANS

Allen C. Harriman, Brockton, Mass., assignor to Jacob S. Kamborian, deceased, by Lisbeth N. Godley, executrix, Washington, D.C.; Michael M. Becka and Jacob S. Kamborian, Jr., executors, both of Nashua, N.H.

Original No. 3,456,273, dated July 22, 1969, Ser. No. 694,942, Jan. 2, 1968. Application for reissue Mar. 27, 1975, Ser. No. 562,744

Int. Cl.[2] A43D *21/00*

U.S. Cl. 12—12.5 4 Claims



1. A lasting apparatus comprising: a support arrangement for supporting bottom-down a shoe assembly, that comprises a last having an insole located on its bottom and an upper mounted thereon, with a selected portion of the upper margin extending downwardly of the corresponding portion of the insole in such a manner that said portion of the insole substantially lies in a particular plane; a primary arrangement; a back-up plate located above the primary engagement; yieldable means mounting the back-up plate to the primary arrangement so as to provide for limited universal movement of the back-up plate with respect to the primary engagement; [wiping means] *a pair of wipers*; means mounting the [wiping means] *wipers* to the back-up plate for planar *and inward* movement with respect to the back-up plate between a retracted and an advanced position; means for initially maintaining the [wiping means] *wipers* in [its] *their* retracted position in a wiping position that is adjacent to said portion of the shoe assembly, that is in registry with said portion of the insole and that is maintained in a plane that is approximately parallel to said particular plane; means for thereafter moving the [wiping means] *wipers rearwardly and inwardly* from [its] *their* retracted to [its] *their* advanced position through a wiping stroke to wipe said upper margin portion against said insole portion, said yieldable means mounting the back-up plate to the primary engagement enabling the [wiping means] *wipers* during the wiping stroke to partake of said limited universal movement so as to conform precisely to the plane of said portion of the insole; and means effective only at the beginning of the wiping stroke to constrain the [wiping means] *wipers* against said limited universal movement provided by the yieldable means, whereby the yieldable means is operative on the [wiping means] *wipers* only after the [wiping means has] *wipers have* commenced to wipe said upper margin portion against said insole portion.

Re. 28,825

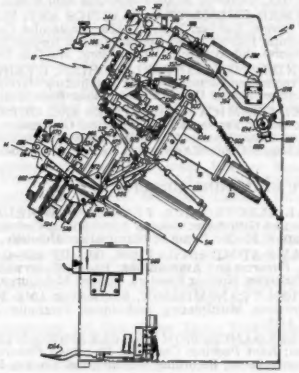
METHOD AND APPARATUS FOR USE IN LASTING SHOES

Jacob S. Kamborian, deceased, late of Newton, Mass., by Lisbeth N. Godley, executrix, Washington, D.C.; Michael M. Becka and Jacob S. Kamborian, Jr., executors, both of Nashua, N.H.; Allen C. Harriman, Brockton, Geoffrey T. Jones, Walpole, and Karl F. Vornberger, Tewksbury, all of Mass., assignors to Lisbeth N. Godley, Washington, D.C.; Michael M. Becka and Jacob S. Kamborian, Jr., both of Nashua, N.H., executors of the estate of Jacob S. Kamborian, deceased

Original No. 3,422,474, dated Jan. 21, 1969, Ser. No. 528,430, Feb. 18, 1966. Application for reissue Mar. 27, 1975, Ser. No. 562,692

Int. Cl.[2] A43D *21/00*

U.S. Cl. 12—145 150 Claims



1. A method of lasting comprising: supporting bottom-down a shoe assembly, that comprises a last having an insole located on its bottom and an upper mounted thereon with at least the heel portion of the upper margin extending downwardly of the insole, in such a manner that the forepart of the shoe assembly lies in a predetermined location and the heel portion of the shoe assembly bottom extends forwardly of said forepart portion and substantially lies in a particular plane that is dependent on the size and style of the shoe assembly; providing a heel section that is located forwardly of the shoe assembly, said heel section incorporating heel wiping means adapted to lie in a plane that is substantially parallel to said particular plane; initially maintaining the heel wiping means in a retracted position; initially maintaining the heel section in a forward position wherein the heel wiping means is remote from and out of registry with the heel portion of the insole; moving the heel section from its forward position through a compound movement having a first component of movement that has a rearward direction and a second component of movement that has a heightwise direction to a wiping position wherein the heel wiping means is adjacent to the heel portion of the shoe assembly with the heel wiping means in registry with the heel portion of the insole while the heel wiping means is maintained in a plane substantially parallel to said particular plane; and thereafter moving the heel wiping means in a heel

wiping stroke from its retracted position into an advanced position in a substantially planar path parallel to said particular plane to wipe the heel portion of the upper margin against the insole.

Re. 28,826

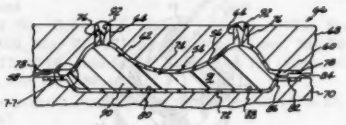
METHOD OF CONSTRUCTING MOLD FOR FORMING PLASTIC FOAM

Michael Ladney, Jr., 18125 East Ten Mile Road, East Detroit, Mich. 48021

Original No. 3,871,060, dated Mar. 18, 1975, Ser. No. 437,792, Jan. 30, 1974. Continuation of Ser. No. 213,244, Dec. 29, 1971, abandoned. Application for reissue Apr. 25, 1975, Ser. No. 571,794

Int. Cl.² B23P *19/00*

U.S. Cl. 29—428 **4 Claims**



1. A method of constructing a mold having a cavity in which a plastic foam part is adapted to be molded, said mold including a pair of separable mold sections, each of which is adapted to receive an injection molded cavity-forming liner which, when the mold sections are closed with one another, cooperate to define said mold cavity, comprising the steps of forming two pair of metal dies, each pair having molding surfaces which correspond with a half section of the exterior surfaces of the foam part to be molded, utilizing each pair of said metal dies to form an injection molding cavity defined by the respective molding surfaces of said two metal dies; subjecting a thermoplastic synthetic resin material to sufficient heat and pressure to plasticize the same and injection molding said material in said injection molding cavity of each pair of said metal dies to form a pair of injection molded thermoplastic liners for said foam mold sections each having an exterior surface contour formed by the molding surface of its respective pair of metal dies which is the reverse of the external surface contour of the two opposite sides of the plastic foam part to be molded; removing said injection molded liners from said pairs of metal dies; and inserting the two injection molded liners in opposed relation, one in each of said separable mold sections such that when the mold sections are closed said exterior surface contours of the two liners cooperate to define a foam molding cavity which corresponds in size, shape and contour to the size, shape and contour of the foam part to be molded therein.

Re. 28,827

METHOD AND APPARATUS FOR COIN DISCRIMINATION UTILIZING A COIN IMPELLER

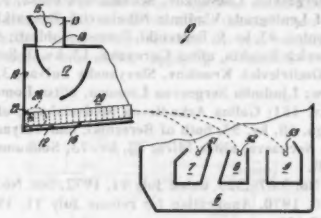
Guy L. Fougere, Lincoln, Mass., assignor to Mars, Inc., McLean, Va.

Original No. 3,757,918, dated Sept. 11, 1973, Ser. No. 269,129, July 5, 1972. Continuation-in-part of Ser. No. 120,652, March 3, 1971, Pat. No. 3,701,405, which is a continuation-in-part of Ser. No. 858,351, Sept. 16, 1969, abandoned. Application for reissue Dec. 10, 1973, Ser. No. 423,214

Int. Cl.² G07F *3/02*

U.S. Cl. 194—101 **23 Claims**

3. The method of [claim 1] *determining the acceptability of coins comprising the steps of generating a traveling magnetic field, directing a coin to a coin support track in the magnetic field so that the force of the field impels the coin along the coin support track projecting it in a desired direction and accepting the coin only if it has a trajectory after it leaves the coin support track characteristic of a desired coin,* further comprising the step of making a preliminary classification of the coin and



wherein as a result of that classification a value of a characteristic of the magnetic field is selected.

Re. 28,828

ELECTROPHOTOGRAPHIC COPYING DEVICE

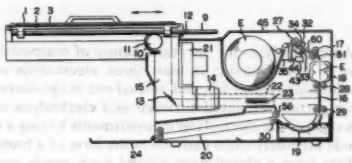
Shigehiro Komori, Yokohama; Jiro Sato, and Akira Kurahashi, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Original No. 3,614,220, dated Oct. 19, 1971, Ser. No. 780,653, Dec. 3, 1968. Application for reissue Oct. 5, 1973, Ser. No. 404,122

Claims priority, application Japan, Dec. 11, 1967, 42-79376; Dec. 15, 1967, 42-105383

Int. Cl.² G03G *15/00*

U.S. Cl. 355—8 **4 Claims**



4. An electrophotographic copying device comprising in combination a reciprocally movable holder for supporting an original, said holder having a visible reference for locating relative thereto one edge of the area of an original to be copied, an adjustable index member positionable alongside said original adjacent the opposite edge of said area to be copied, means for holding a supply roll of copying material, electromechanical cutoff means, means for forming on said copying material an image of said area to be copied, means for feeding said copying material from said roll over a predetermined path past said cutoff means to said image forming means including separate feed means located before and after said cutoff means, said image forming means including exposure means operable while said holder is moving for projecting an image from an original supported on said holder, for use in forming the image upon said copying material as the latter passes through said image forming means, switch means for controlling both said cutoff means and that feed means which is located before said cutoff means to simultaneously sever said copying material and interrupt the feeding of said material from said roll, and means interrelating said adjustable index member with said switch means for causing said switch means to be actuated after said holder has moved during projection of said image a distance equal to the difference between the length between said edges of said area to be copied and a predetermined length through which said copying material extends beyond said cutoff means at the commencement of said projection of said image.

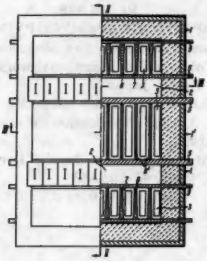
Re. 28,829
FUSED SALT ELECTROLYZER FOR MAGNESIUM PRODUCTION

Khaim Lipovich Strelets, ulitsa Furmanova, 19, kv. 2; Alexandr Sergeevich Chesnokov, Schastlivaya ulitsa, 9, kv. 28, both of Leningrad; Vladimir Nikolaevich Devyatkin, prospect Lenina, 43, kv. 9, Berezniki, Permskoi oblasti; Alexandr Nikolaevich Tatakin, ulitsa Gornyaka, 13, kv. 3, Solikamsk; Evsei Dmitrievich Krasikov, Slavyansky bulvar, 3, kv. 51, Moscow; Ljudmila Sergeevna Leonova, ulitsa Lomonosova, 105, kv. 151; Galina Arkadievna Medvetskaya, ulitsa Lva Tolstogo, 68, kv. 53, both of Berezniki, and Tatyana Georgievna Nechaeva, ulitsa Mira, 42, kv. 73, Solikamsk, all of U.S.S.R.

Original No. 3,676,323, dated July 11, 1972, Ser. No. 96,835, Dec. 10, 1970. Application for reissue July 11, 1974, Ser. No. 487,630

Int. Cl.² C25C *3/08, 3/04*

U.S. Cl. 204—244 **5 Claims**



1. An electrolyzer for the manufacture of magnesium, comprising in combination: at least three electrolysis compartments housing electrodes; and at least one magnesium collecting compartment located between said electrolysis compartments each of the electrolysis compartments having a plurality of anode members and a cathode in the form of a frame whose members form a closed loop around each anode member in said electrolysis compartment.

Re. 28,830
METHOD FOR REDUCING SULFUR COMPOUNDS IN SULFUR PLANT EFFLUENT

Elton B. Hunt, Jr., and Karol L. Hujsak, both of Tulsa, Okla., assignors to Amoco Production Company, Tulsa, Okla.

Original No. 3,702,884, dated Nov. 14, 1972, Ser. No. 39,844, May 22, 1970. Application for reissue Nov. 4, 1974, Ser. No. 520,323

Int. Cl.² C01B *17/04*

U.S. Cl. 423—574 R **4 Claims**

4. In a process for removing hydrogen sulfide and sulfur dioxide in the condenser effluent from a Claus catalytic reaction zone, the improvement comprising:

(1) introducing said effluent into a second catalytic reaction zone at an inlet temperature of about 250° to 400°F whereby sulfur is deposited on the surface of the catalyst in said second zone and continuing the deposition of sulfur on the catalyst in said second zone until the amount of hydrogen sulfide and sulfur dioxide in the effluent from said second zone reaches a preset allowable limit,

(2) effecting removal of said deposit from the catalyst in said second zone by contacting the catalyst therein at a temperature from about 450° to 700°F with gas stream (1) produced in Step (4),

(3) withdrawing from said second zone a mixture (1) of sulfur vapors and gas stream (1),

(4) cooling mixture (1) to produce liquid sulfur and cooled gas stream (1),

(5) recycling gas stream (1) cooled in Step (4) to cool the catalyst in said second zone, and repeating Steps (1) to (5) while equalizing the system pressure in Steps (1) through (5) by transfer of gas between cooled gas stream (1) and said effluent.

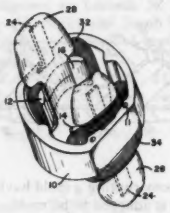
Re. 28,831
ELECTRIC MOTOR WINDING

Grayson Brown, Riverside, Conn., assignor to Consolidated Foods Corporation, Chicago, Ill.

Original No. 3,822,391, dated July 2, 1974, Ser. No. 322,607, Jan. 11, 1973. Application for reissue Oct. 15, 1974, Ser. No. 514,790

Int. Cl.² H02K *3/00*

U.S. Cl. 310—194 **3 Claims**



1. In a rotary electric machine, a stator core having poles, a field coil comprising a plurality of turns of conductive insulated wire wound on each pole and extending axially on either side thereof, said core being formed with an axially extending aperture therethrough located at the circumferential center of each pole, and a strip of *electrically insulated* bendable metal [secured to said core] extending through each aperture and axially beyond said core in each direction, *the extending portion of each strip being bent to form off-sets which bear against opposite ends of the core to prevent longitudinal displacement of each strip with respect to the core*, the extending portions of said turns being supported by the extending portions of said strips *beyond said off-sets*, said extending portions of said strips being bent around said extending portions of said turns for anchoring said turns in fixed position on said core.

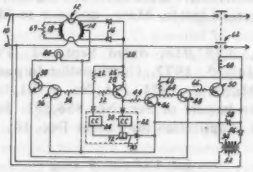
Re. 28,832
COULOMETRIC METERING DEVICE

Allyn N. Goshy, 813 Queens Lane, Anoka, Minn. 55303, and Russell L. Rehm, Rte. 5, Box 69, Excelsior, Minn. 55331

Original No. 3,768,008, dated Oct. 23, 1973, Ser. No. 290,573, Sept. 20, 1972. Application for reissue June 11, 1975, Ser. No. 586,054

Int. Cl.² G01R *11/44*

U.S. Cl. 324—94 **8 Claims**



1. A device for metering electric current usage comprising: a current transformer having a primary winding for connection to a power line to be metered,

a full-wave rectifier including a center-tap secondary winding on the transformer,

a removable cartridge containing at least two electro-plating coulometric cells, each of which initially has a known plating charge and experiences a sharp voltage rise upon deplating,

a switching device normally connecting only a first of said coulometric cells across the rectifier, which switching device is responsive to the sharp voltage rise in the first coulometric cell for connecting the second coulometric cell across the rectifier and for providing a perceptible indication thereof *to warn that the cartridge needs to be removed to recharge the cells.*

Re. 28,833

ANALOGUE TO DIGITAL CONVERTER

Howard Anthony Dorey, Farnborough, England, assignor to The Solartron Electronic Group Limited, Farnborough, England

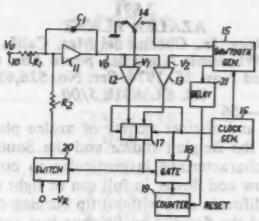
Original No. 3,745,556, dated July 10, 1973, Ser. No. 141,340, May 7, 1971. Continuation of Ser. No. 769,588, Oct. 22, 1968, abandoned. Application for reissue May 23, 1975, Ser. No. 580,402

Claims priority, application United Kingdom, Oct. 25, 1967, 48587/67

Int. Cl.² G01R *17/00, 17/02;* **H03K** *13/02*

U.S. Cl. 340—347 NT **16 Claims**

1. An ADC comprising in combination: integrating means having an input and an output, means for applying a first electrical signal continuously throughout a measurement period to the input of said integrating means, a circuit means having two states for applying a second electrical signal opposing said first signal to the integrating means input when in one of said two states, said integrating means being responsive to the application of said first and second signals to produce an output signal at the integrating means output which ramps up and down during said measurement period as the states of said circuit means alternate, level detection means responsive to two different levels of said output signal to cause said circuit to switch alternatively to the two states thereof when the said two levels are respectively reached by said output signal, signal generator means for applying a variable waveform



signal to said level detection means to cause at least one of said detection levels to vary in accordance with a predetermined function independent of the magnitude of said first electrical signal, and a clock pulse generator and counter means for counting clock pulses from said clock pulse generator while said circuit means is in one of said two states, whereby the pulses counted by said counter means are representative of the magnitude of the first electrical signal.

Re. 28,829

FUSED SALT ELECTROLYZER FOR MAGNESIUM PRODUCTION

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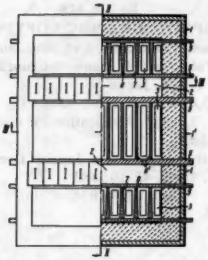
Original No. 3,676,323, dated July 11, 1972, Ser. No. 96,835, Dec. 10, 1970. Application for reissue July 11, 1974, Ser. No. 487,630

Int. Cl.[2] C25C *3/08, 3/04*

U.S. Cl. 204—244 **5 Claims**



1. An electrolyzer for the manufacture of magnesium, comprising in combination: at least three electrolysis compartments housing electrodes; and at least one magnesium collecting compartment located between said electrolysis compartments each of the electrolysis compartments having a plurality of anode members and a cathode in the form of a frame whose members form a closed loop around each anode member in said electrolysis compartment.

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Int. Cl.[2] C01B *17/04*

U.S. Cl. 423—574 R **4 Claims**

4. In a process for removing hydrogen sulfide and sulfur dioxide in the condenser effluent from a Claus catalytic reaction zone, the improvement comprising:

(1) introducing said effluent into a second catalytic reaction zone at an inlet temperature of about 250° to 400°F whereby sulfur is deposited on the surface of the catalyst in said second zone and continuing the deposition of sulfur on the catalyst in said second zone until the amount of hydrogen sulfide and sulfur dioxide in the effluent from said second zone reaches a preset allowable limit,

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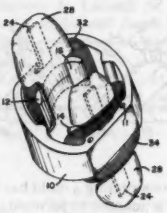
Int. Cl.[2] H02K *3/00*

U.S. Cl. 310—194 **3 Claims**



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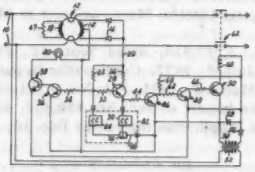
Int. Cl.[2] G01R *11/44*

U.S. Cl. 324—94 **8 Claims**



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a full-wave rectifier including a center-tap secondary winding on the transformer,

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U.S. Cl. 340—347 NT **16 Claims**

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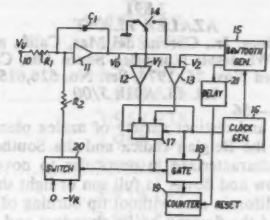


signal to said level detection means to cause at least one of said detection levels to vary in accordance with a predetermined function independent of the magnitude of said first electrical signal, and a clock pulse generator and counter means for counting clock pulses from said clock pulse generator while said circuit means is in one of said two states, whereby the pulses counted by said counter means are representative of the magnitude of the first electrical signal.

PLANT PATENTS

GRANTED MAY 25, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,891
AZALEA PLANT

James W. Hines, Jr., Corona del Mar, Calif., assignor to Hines Wholesale Nurseries, Santa Ana, Calif.

Filed Nov. 25, 1974, Ser. No. 526,615
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—56 **1 Claim**

1. A new and distinct variety of azalea plant which is a hybrid of the Belgian Indica and the Southern Indica strain, and characterized in particular to novelty by its ability to grow and flower in full sun or light shade in the Southern California area without tip burning of the leaves or blasting of the flowers; by its abundant and rich green foliage and compact and dense habit of growth; by the unique coloring of its flowers; and by its profuse flowering; and by its greater salts tolerance, making it less subject to root diseases common to other varieties grown in the same general area of the Irvine Ranch in Southern California.

3,892
LILAC PLANT

Walter E. Lammerts, Corralitos, Calif., assignor to Hines Wholesale Nurseries, Santa Ana, Calif.

Filed Mar. 24, 1975, Ser. No. 561,325
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—66 **1 Claim**

1. A new and distinct variety of lilac plant, substantially as herein shown and described, characterized particularly as to novelty by its relatively short and mild winter-chilling requirements, by its regular and abundant production of large flower clusters consisting of large individual florets, by its vigorous habit of plant growth, and by its abundant production of large and attractive foliage.

3,893
LILAC PLANT

Walter E. Lammerts, Corralitos, Calif., assignor to Hines Wholesale Nurseries, Santa Ana, Calif.

Filed Mar. 24, 1975, Ser. No. 561,328
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—66 **1 Claim**

1. A new and distinct variety of lilac plant, substantially as herein shown and described, characterized particularly as to novelty by its relatively short and mild winter-chilling requirements, by its regular and abundant production of large flower clusters consisting of large individual florets, by its vigorous habit of plant growth, and by its abundant production of large and attractive foliage.

3,894
AZALEA PLANT

James W. Hines, Jr., Corona del Mar, Calif., assignor to Hines Wholesale Nurseries, Santa Ana, Calif.

Filed Nov. 25, 1974, Ser. No. 526,619
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—56 **1 Claim**

1. A new and distinct variety of azalea plant which is a hybrid of the Belgian Indica strain and the Southern Indica strain, and characterized in particular to novelty by its ability to grow and flower in full sun or light shade in the Southern California area without tip burning of the leaves or blasting of the flowers; by its abundant and rich green foliage and compact and dense habit of growth; by the unique coloring of its flowers; and by its profuse flowering; and by its greater salts tolerance, making it less subject to root diseases common to other varieties grown in the same general area of the Irvine Ranch in Southern California.

3,895
LILAC PLANT

Walter E. Lammerts, Corralitos, Calif., assignor to Hines Wholesale Nurseries, Santa Ana, Calif.

Filed Mar. 24, 1975, Ser. No. 561,326
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—66 **1 Claim**

1. A new and distinct variety of lilac plant, substantially as herein shown and described, characterized particularly as to novelty by its relatively short and mild winter-chilling requirements, by its regular and abundant production of large flower clusters consisting of large individual florets, by its vigorous habit of plant growth, and by its abundant production of large and attractive foliage.

PATENTS

GRANTED MAY 25, 1976

ERRATA

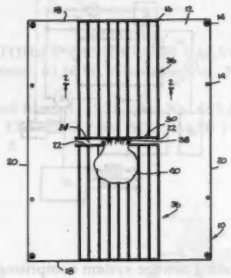
For CLASS	See PATENT NO.
138–149	3,958,582
176–017	3,958,645
160–049	3,958,676
303–022 R	3,958,838
403–090	3,958,904
195–141	3,959,120
260–077.5 R	3,959,149
526–062	3,959,235
526–016	3,959,237
526–281	3,959,238
526–341	3,959,240
526–232	3,959,241
526–009	3,959,242
528–494	3,959,243
526–084	3,959,244
423–086	3,959,465
427–430	3,959,564
135–004 R	3,959,588
178–069	3,959,601
191–012 R	3,959,608
357–048	3,959,812

PATENTS

GRANTED MAY 25, 1976

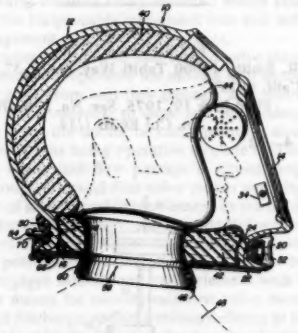
GENERAL AND MECHANICAL

3,958,274
COMBINED PONCHO-MATTRESS
Mark Klauber, 16 Lawson Lane, Great Neck, N.Y. 11023
Filed Oct. 25, 1974, Ser. No. 517,885
Int. Cl.² A41D *3/08, 15/04*
U.S. Cl. 2—69 **7 Claims**



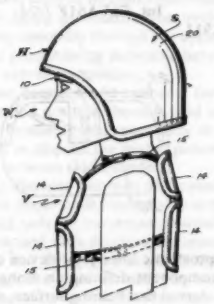
1. A combined poncho-mattress, composed of a pliable, air-tight and water-proof material, comprising a substantially rectangular main sheet provided with a central transverse head slot, a secondary sheet extending from each side of the head slot to an opposing shorter edge of the main sheet in aligned relationship with one another, parallel to and spaced from the longer edges of the main sheet, each of the secondary sheets secured to the main sheet to form a series of parallel, expansible sleeves, a transverse opening in each secondary sheet leading into the sleeves, means to selectively close the opening, and means to expand the sleeves to form a resilient mattress.

3,958,275
HELMET FOR DIVERS
Bevly B. Morgan, 3319 Braemar Drive, Santa Barbara, Calif. 93105, and Robert R. Kirby, P.O. Box 665, Santa Ynez, Calif. 93460
Filed Mar. 6, 1975, Ser. No. 556,172
Int. Cl.² B63C *11/02*
U.S. Cl. 2—2.1 R **8 Claims**



1. A diving helmet construction including a rigid helmet body having peripherally continuous front, opposite side and rear upstanding wall portions and an upper wall portion closing the upper end of said body, the lower portion of said body being open and defining an access opening, said front wall portion having a fluid-tight window, breathing air inlet and exhaust means opening through said body into the interior thereof from the exterior of said body, a resilient and axially compressible and radially expandable fluid impervious doughnut-shaped collar expandable downwardly over the head of a diver and snugly received within said access opening, an at least semi-rigid body defining a narrow neck receiving slot opening into a central void positioned beneath the open lower end of said helmet and said collar, a tubular, flexible expandable and fluid imperious neck dam provided at one end with clamp means removably clampingly engaged about the lower portion of said body defining said access opening, the other end of said neck dam being sealingly engageable with the neck of the user, said clamp means and yoke including releasably engaged coacting anchor structure releasably retaining said yoke and clamp ring against axial separation with the portions of said neck dam disposed between the opposite ends thereof clamped between said yoke and collar.

3,958,276
HELMET
Carol W. Clausen, 1715 E. Florence Ave., Los Angeles, Calif. 90001
Filed July 9, 1975, Ser. No. 594,351
Int. Cl.² F41H *1/02*
U.S. Cl. 2—2.5 **7 Claims**

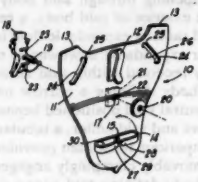


1. A bullet-proof body-protecting wall structure comprising a thin resilient integrated laminated flexible woven fabric and a resin impregnated outer skin with inner and outer surfaces, a non-integrated laminated flexible woven fabric core with inner and outer surfaces arranged with its outer surface adjacent the inner surface of the outer skin to yieldingly support said skin against inward deflection and a soft resilient inner liner with inner and outer surfaces and arranged with its outer surface adjacent the inner surface of the core to yieldingly support said core against inward deflection, said inner surface of the inner liner adapted to be disposed substantially adjacent to a portion of the body to be protected and said outer surface of the outer skin adapted to be disposed substantially normal and opposite to the line and direction of flight of a bullet directed toward said portion of the body.

3,958,277
TIE CLASP

George W. Girdler, Hialeah, Fla., assignor to Jack Steinberg, Miami, Fla., a part interest

Filed Sept. 15, 1975, Ser. No. 613,172
Int. Cl.² A41D 25/08
U.S. Cl. 2—153 11 Claims

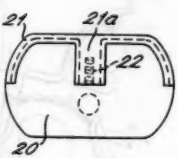


1. A tie clasp for supporting neckwear comprising a plate adapted to be positioned on the front of a shirt collar; hook means mounted on the back of said plate for suspending said plate from the shirt collar; and receiving means mounted on the back of said plate below said hook means through which neckwear may be passed generally horizontally or vertically in draping the neckwear ends in mutual lateral or overlaid positions, respectively.

3,958,278
ENDOPROSTHETIC KNEE JOINT

Alan John Clive Lee, Exeter, and Robin Sydney Mackwood Ling, Teignmouth, both of England, assignors to National Research Development Corporation, London, England

Filed Apr. 22, 1975, Ser. No. 570,954
Claims priority, application United Kingdom, Apr. 22, 1974, 17502/74
Int. Cl.² A61F 1/24
U.S. Cl. 3—1.911 11 Claims

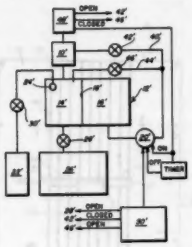


1. An endoprosthetic knee joint device comprising:
a femoral component defining an elongate longitudinally-convexly-curved first bearing surface, adapted for securement to the femur to locate said first surface as a femoral condylar surface replacement, and of integral construction from a first material;
a tibial component base part made of said first material, having a platform portion defining in one major face thereof a recess with undercut side walls, having a clamp member which forms part of said recess and said side walls and is detachable to allow access to said recess, and said platform portion being adapted remotely from said recess for securement to the tibia as a tibial condylar replacement;
and a tibial component bearing part made of a second material of lesser mechanical stability and strength than said first material, being substantially complementary to but having a thickness greater than the depth of said recess, being releasably captively engaged in said recess by said side walls and said clamp member, and defining remotely from said recess a second bearing surface in mutual articulatory engagement with said first bearing surface.

3,958,279
RECIRCULATING SEWERAGE SYSTEM

Frank J. Bogusz, Farmington, Conn., assignor to Koehler-Dayton, Inc., New Britain, Conn.

Continuation-in-part of Ser. No. 428,337, Dec. 26, 1973, abandoned. This application Oct. 30, 1974, Ser. No. 519,085
Int. Cl.² E03D 5/016
U.S. Cl. 4—10 12 Claims

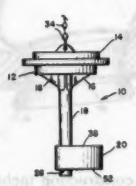


1. A recirculating sewage system comprising
a toilet,
a recirculating tank,
a drain conduit communicating with the bottom portion of said recirculating tank,
valve means for controlling the gravitational flow of sewage from said recirculating tank through said drain conduit,
means for directing the effluent flushed from said toilet into said recirculating tank,
normally deenergized pump means communicating with said recirculating tank
means for operating the system in a flushing mode whenever said toilet is to be flushed including means for energizing said pump means and means for recirculating the effluent discharged by said pump means to said toilet to flush same, and
means for operating the system in a drain mode whenever the recirculating tank is to be drained including means for energizing said pump means, means for opening said valve means whereby the sewage will gravitationally flow out of said recirculating tank through said drain conduit, and means for recirculating the effluent discharged by said pump means to said recirculating tank to establish turbulence in the contents thereof whereby a more effective drainage of said recirculating tank will be assured.

3,958,280
FLUSHING VALVE

Bobbie R. Smith, 14000 Tahiti Way, No. P-37, Marina Del Rey, Calif. 90291

Filed May 19, 1975, Ser. No. 578,478
Int. Cl.² E03D 1/34
U.S. Cl. 4—52 8 Claims



1. A water closet flushing valve comprising:

a valve body having a valve seat and a centrally located valve guide located below said valve seat in the normal flow pattern,

a valve for nesting with said valve seat and having a valve stem adapted to fit within said valve guide, and

a floatable member attached to a flexible resilient portion of said valve guide wall for interfering with the movement of said valve stem,

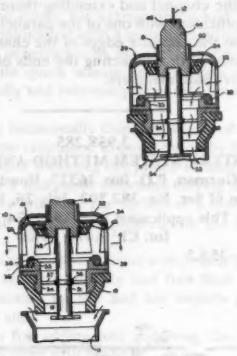
said float being located in said flow pattern whereby fluid flow through the valve seat contacts said floatable member which flexes the valve guide wall for interfering with the movement of the valve stem.

3,958,281

TOILET TANK FLUSH VALVE

William P. Remmel, 6126 W. Wisconsin Ave., Milwaukee, Wis. 53213

Filed Mar. 5, 1975, Ser. No. 555,582
Int. Cl.² E03D *1/34*, *5/02*; A61B *19/00*
U.S. Cl. 4—67 A **9 Claims**



1. A flush valve for normally closing a discharge opening and movable away from the discharge opening for discharging the contents of an enclosure, the improvement comprising:

first valve means including a hollow enclosure portion and a first valve element mounted on the lower end of said hollow portion and engageable with said discharge opening, a flow passage formed in said first valve element,

a second valve element being mounted within said hollow portion for reciprocable movement into and out of sealing engagement with said flow passage,

operating means coupled to said second valve element and being selectively operable for moving said second valve element away from said flow passage, said second valve element being operable to close said flow passage when released from the action of said operating means, said first valve means being operative to close said discharge opening when said flow passage is closed, engageable means coupled to said first valve means and disposed in the path of said second valve element as the latter moves toward its open position, whereby partial movement of said operating means moves said second valve element to its open position and further movement of said operating means engages said second valve element with said engageable means for moving said first valve means away from said discharge opening, means defining at least one opening in said hollow portion for passage of water therethrough when said second valve element is moved a partial distance away from said flow passage, and

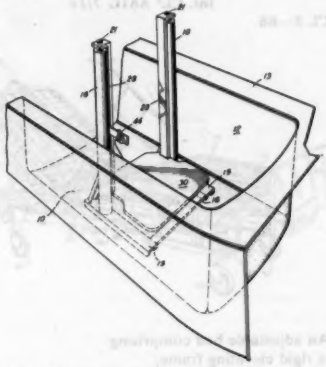
coupling means formed on the upper end of said second valve element for engaging one end of a lift rod, an opening formed in the upper end of said hollow portion for passage of said lift rod therethrough.

3,958,282

PORTABLE SEAT LIFT FOR USE IN BATHTUBS

Wylie W. Crowe, 438 18th Ave., Indian Rocks Beach, Fla. 33535

Filed July 30, 1974, Ser. No. 493,034
Int. Cl.² A47K *3/12*
U.S. Cl. 4—185 L **3 Claims**



1. A portable seat lift for a bathtub comprising:

a. a base for mounting on the bathtub floor;

b. a pair of opposed, upstanding, parallel, transversely spaced, cylinders secured by their lower ends to said base, said cylinders being provided respectively with piston rods protruding upwardly through the upper ends of said cylinders, said pistons being moveable between retracted positions and extended positions;

c. a seat disposed between said cylinders for supporting a person in a seated position thereon, said seat extending longitudinally forwardly and rearwardly of said opposed cylinders so as to dispose the seated person in an unobstructed area between said cylinders;

d. a pair of arms disposed between said cylinders and connected by their upper ends respectively to the upper end portions of said rods for movement therewith, said arms extending from said rods downwardly inwardly adjacent said cylinders and being connected by their lower end portions to opposite sides of said seat, said arms being transversely between said cylinders and shielding the body of said person seated on said seat from engagement with said cylinders, said arms being sufficiently long that, when said rods are in their retracted positions, said seat is disposed adjacent to said floor of said bathtub so that said person may recline in said bathtub while remaining on said seat and, when said rods are in their extended positions, said seat is raised so as to lift the person seated therein to a raised position above said floor;

e. means for directing water from the faucet of said tub into said cylinders for applying hydraulic pressure for extending of said rods, said means including a valve having an inlet and an outlet and selectively moveable between a first position in which the water passes from said faucet into said cylinders to extend said rods and a second position for releasing said water from said cylinders through said outlet into said bathtub to permit said rods to retract; said valve including a third position for sealing off the hydraulic cylinders from said inlet and said outlet to maintain said rods and said seat in stationary positions; and

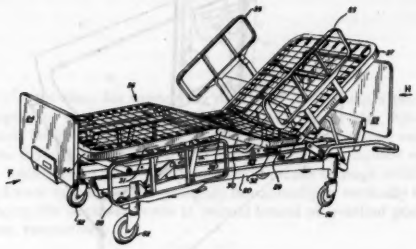
f. a lever mounted for movement with said seat, and a throttle cable extending from said lever to said valve for interconnecting the same to permit the positioning of said valve to be controlled by manipulation of said lever.

3,958,283

ELEVATING AND TRENDELENBURG MECHANISM FOR AN ADJUSTABLE BED

James S. Adams; William H. Peck, and Daniel R. Tekulve, all of Batesville, Ind., assignors to Hill-Rom Company, Inc., Batesville, Ind.

Filed Aug. 9, 1974, Ser. No. 496,212
Int. Cl.² A61G 7/14
U.S. Cl. 5—66 **41 Claims**



1. An adjustable bed comprising:
A. a rigid elevating frame;
B. two torque tubes pivotally attached to said frame and lying substantially parallel to and spaced apart from each other;
C. lifting means rigidly attached to and extending transversely from said torque tubes and capable of supporting said torque tubes and said frame;
D. drive means attached to said torque tubes for rotating said torque tubes;
E. motive means coupled to said drive means for moving said drive means to produce rotation of said torque tubes to raise and lower said frame;
F. retaining means movable into a position of engagement when said frame is at a predetermined elevation for preventing rotation of one of said torque tubes in a direction to lower said frame; and
G. actuating means for moving said retaining means into said position of engagement, said actuating means being ineffective to move said retaining means when said retaining means is in a position of engagement.

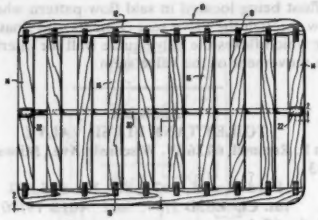
3,958,284

BED FRAME CONSTRUCTION

John Calvin Jureit, 8901 Arvida Lane, Coral Gables, Fla. 33156, and Andrew G. Seipos, 650 NE. 31st St., Apt. 16C, Miami, Fla. 33137

Division of Ser. No. 392,224, Aug. 28, 1973. This application Dec. 4, 1974, Ser. No. 529,681
Int. Cl.² A47C 19/00
U.S. Cl. 5—200 R **9 Claims**

1. A bed frame comprising a pair of elongated wooden members for forming the substantially rigid side members of the frame, a pair of wooden end members disposed between said side members adjacent opposite ends thereof, a plurality of longitudinally spaced sheet metal members extending transversely between said side frame members intermediate of said end members and in substantial coplanar relation with said side and end members, means for joining the opposite ends of each said intermediate member to the respective side members including a plate integrally formed with said intermediate member at each of its opposite ends, each of said end plates having a plurality of teeth struck to project to one side and embedded into the corresponding side member for supporting said intermediate member from said side members, each of said intermediate members being channel shaped with the end plates being formed from endwise continuations of the base



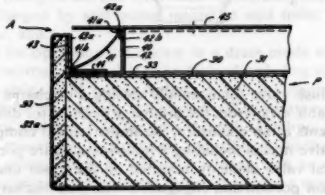
portion of the channel and extending therefrom substantially within or coincident with one of the parallel planes containing the base and the opposite edges of the channel shaped members, and means for connecting the ends of said members to the respective side members.

3,958,285

UPHOLSTERY SYSTEM METHOD AND APPARATUS

DeWitt Y. Gorman, P.O. Box 26323, Houston, Tex. 77032

Division of Ser. No. 382,702, July 26, 1973, Pat. No. 3,896,531. This application Dec. 19, 1974, Ser. No. 534,401
Int. Cl.² A47C 23/00
U.S. Cl. 5—353.3 **7 Claims**



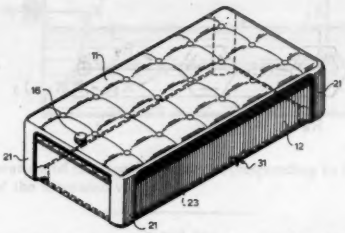
1. An upholstery unit, including:
a cushion base adapted for mounting with a support structure and having a plurality of corners;
cushioning means mounted with said base for providing a resilient support to a user;
a foldable unformed sheet of decorative upholstery covering arrangeable about said cushion base and said cushioning means and folded adjacent each of said corners to provide a viewed surface of pleasing appearance;
a shield member positioned within at least one fold to eliminate wrinkles formed in said viewed surface of the sheet of upholstery covering by the folded portion of the sheet of upholstery covering folded behind said viewed surface; and
means for releasably fastening with said base sheet of unformed decorative upholstery covering arranged about said cushioning means to removably secure said sheet of unformed upholstery covering about said cushioning means in a manner to provide a substantially wrinkle free appearance of upholstery covering.

3,958,286

FIRE EXTINGUISHING MATTRESS COVER

Theodore F. Rodinsky, 24476 Schoolcraft, Detroit, Mich. 48223

Filed July 1, 1974, Ser. No. 484,600
Int. Cl.² A47G 9/00
U.S. Cl. 5—335 11 Claims



1. A liquid filled cover for extinguishing and preventing bedding fires in combination with a mattress said cover having a low resistance to penetration by fire and hot objects capable of initiating fire with quick release and free flow of the confined liquid internally and externally from said cover comprising:

upper and lower horizontally disposed sheets of thin material having a low resistance to penetration by fire and hot objects capable of initiating fire joined at their outermost edges to form a leakproof enclosure having a shape for substantially covering the top surface of a mattress and a relatively small height as compared the the length and breath;

a fire extinguishing liquid confined within said cover until caused to be released quickly and free flow when said cover is penetrated by fire and hot objects capable of initiating fire; and

a closure means for adding and removing the fire extinguishing liquid from said cover.

3,958,287

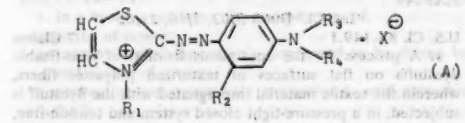
DISCHARGEABLE BLACK DYEING ON ACID MODIFIED POLYESTER FIBER

Tetsuo Okaniwa, Minoo, and Sadaharu Abeta, Toyonaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 27, 1975, Ser. No. 581,304
Claims priority, application Japan, May 24, 1974, 49-58948; May 24, 1974, 49-58949
Int. Cl.² D06P 1/08
U.S. Cl. 8—26 9 Claims

1. A process for dyeing acid modified polyester fibers a black comprising contacting said polyester fibers with a dye bath containing a combination of dyes comprising:

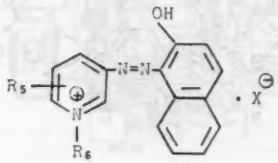
1. at least one dye of the formula (A):



(A)

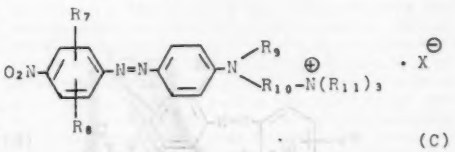
wherein R_1 is a C_1–C_3 alkyl group which may be unsubstituted or substituted with a hydroxy group of a C_1–C_4 alkoxy group; R_2 is a hydrogen atom or a C_1–C_3 alkyl group; R_3 and R_4, which may be the same or different, each is a cyclohexyl group, a C_1–C_3 alkyl group which may be unsubstituted or substituted with a hydroxy group or a C_1–C_4alkoxy group, a phenyl group or a C_7–C_8 aralkyl group, which phenyl or aralkyl group may be unsubstituted or substituted with a halogen atom; and X^- is an anion; and

2. at least one dye of the formula (B):



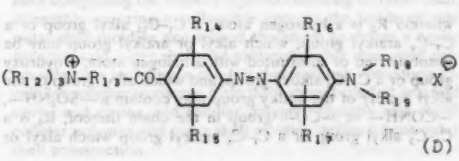
(B)

wherein R_5 is a hydrogen atom, a C_1–C_{12} alkyl group or a C_7–C_8 aralkyl group, which alkyl or aralkyl group may be unsubstituted or substituted with a halogen atom, a hydroxy group or a C_1–C_4 alkoxy group, and which alkyl group or the alkyl moiety of the aralkyl group may contain a —SO_2NH—, —CONH— or —CO— group in the chain thereof; R_6 is a C_1–C_3 alkyl group or a C_7–C_8 aralkyl group which alkyl or aralkyl group may be unsubstituted or substituted with a halogen atom, a hydroxy group or a C_1–C_4 alkoxy group; and X^- is an anion; and of the formula (C):



(C)

wherein R_7 and R_8, which may be the same or different, each is a hydrogen atom, a halogen atom, a C_1–C_3 alkyl group or a cyano group; R_9 is a C_1–C_3 alkyl group or a C_7–C_8 aralkyl group; R_{10} is a C_1–C_3 alkylene group; R_{11} is a C_1–C_3 alkyl group; and X^- is an anion; and of the formula (D):

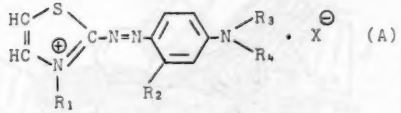


(D)

wherein R_{12} is a C_1–C_3 alkyl group; R_{13} is a C_1–C_3 alkylene group; R_{14}, R_{15}, R_{16} and R_{17}, which may be the same or different, each is a hydrogen atom, a halogen atom or a cyano group; R_{18} and R_{19}, which may be the same or different, each is a hydrogen atom, a C_1–C_3 alkyl group or a C_7–C_8 aralkyl group, which alkyl or aralkyl group may be unsubstituted or substituted with a halogen atom, a cyano group or a hydroxy group; and X^- is an anion.

5. A black dye comprising a combination of,

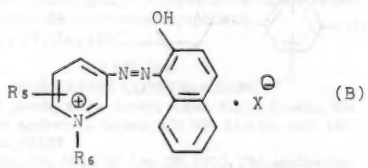
1. at least one dye of the formula (A):



(A)

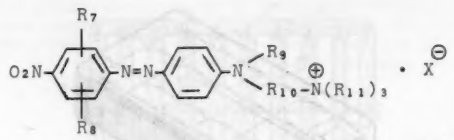
wherein R_1 is a C_1–C_3 alkyl group which may be unsubstituted or substituted with a hydroxy group or a C_1–C_4 alkoxy group; R_2 is a hydrogen atom or a C_1–C_3 alkyl group; R_3 and R_4, which may be the same or different, each is a cyclohexyl group, a C_1–C_3 alkyl group which may be unsubstituted or substituted with a hydroxy group or a C_1–C_4 alkoxy group, a phenyl group or a C_7–C_8 aralkyl group, which phenyl or aralkyl groyp may be unsubstituted or substituted with a halogen atom; and X^- is an anion; and

2. at least one dye of the formula (B):



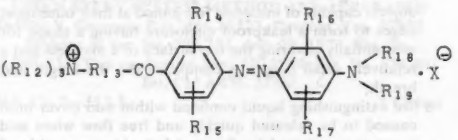
(B)

wherein R_5 is a hydrogen atom, a C_1–C_{12} alkyl group or a C_7–C_8 aralkyl group, which alkyl or aralkyl group may be unsubstituted or substituted with a halogen atom, a hydroxy group or a C_1–C_4 alkoxy group, and which alkyl group or the alkyl moiety of the aralky group may contain a $—SO_2NH—$, —CONH— or —CO— group in the chain thereof; R_6 is a C_1–C_3 alkyl group or a C_7–C_8 aralkyl group which alkyl or aralkyl group may be unsubstituted or substituted with a halogen atom, a hydroxy group or a C_1–C_4 alkoxy group; and X^- is an anion; and of the formula (C):



(C)

wherein R_7 and R_8, which may be the same or different, each is a hydrogen atom, a halogen atom, a C_1–C_3 alkyl group or a cyano group; R_9 is a C_1–C_2 alkyl group or a C_7–C_8 aralkyl group; R_{10} is a C_1–C_3 alkylene group; R_{11} is a C_1–C_3 alkyl group; and X^- is an anion; and of the formula (D);



(D)

wherein R_{12} is a C_1–C_2 alkyl group; R_{13} is a C_1–C_3 alkylene group; R_{14}, R_{15}, R_{16} and R_{17}, which may be the same or different, each is a hydrogen atom, a halogen atom or a cyano group; R_{18} and R_{19}, which may be the same or different, each is a hydrogen atom, a C_1–C_3 alkyl group or a C_7–C_8 aralkyl group, which alkyl or aralkyl group may be unsubstituted or substituted with a halogen atom, a cyano group or a hydroxy group; and X^- is an anion.

3,958,288

PROCESS FOR THE CONTINUOUS DYEING OF HIGH QUALITY POLYESTER FIBERS

Hans-Ulrich von der Eltz, Frankfurt am Main; Egbert Kloss, Kelkheim, Taunus, and Hartwig Kohler, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 26, 1973, Ser. No. 344,966

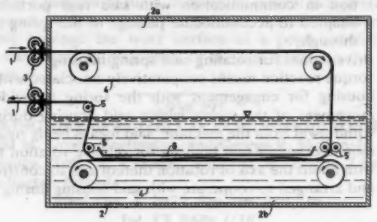
Claims priority, application Germany, Mar. 29, 1972, 2215249

Int. Cl.[2] D06B *3/02, 3/10, 21/02*

U.S. Cl. 8—149.1 **7 Claims**

1. A process for the continuous fixation of heat-fixable dyestuffs on flat surfaces of texturized polyester fibers, wherein the textile material impregnated with the dyestuff is subjected, in a pressure-tight closed system and tension-free,

to a combined treatment with a saturated vapor at an excess pressure of from 1 to 4 atmospheres and a wet treatment, the



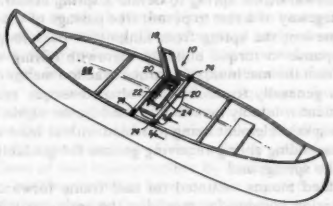
temperature of the treating liquor corresponding to the pressure of the saturated vapor.

3,958,289

CANOE STORAGE COMPARTMENT

Arthur A. Carlson, Suite 210, Plymouth Court Office Center, 12805 Hwy. 55, Plymouth Village, Minn. 55441

Filed Aug. 5, 1974, Ser. No. 495,036
Int. Cl.² B63B *27/00*
U.S. Cl. 9—1.7 **15 Claims**



1. For a canoe, a storage compartment comprising:

A. a compartment of a geometry permitting acceptance of the compartment within a canoe and having an opening of sufficient size for introduction into and removal from the compartment of various articles;

B. a door moveable between positions respectively permitting and preventing introduction into and removal from the compartment of said various articles;

C. door fastener means for securing said door to close said compartment; and,

D. attachment means permitting securement of the compartment to a canoe including at least a pair of opposing handles disposed to be perpendicular to the horizontal axis of a canoe and to extend transversely between the gunnels thereof above and across the full top of the compartment and each of which handles is adapted for attachment to a side of a canoe.

3,958,290

FEEDING DEVICE FOR THE ROTARY DIE HEAD OF AN AUTOMATIC HIGH-SPEED COLD HEADING MACHINE

Yuan Ho Lee, 85, Jen Ho Road, Tainan, China /Taiwan

Filed Mar. 14, 1975, Ser. No. 558,313
Int. Cl.² B21K *1/44*
U.S. Cl. 10—13 **5 Claims**

1. In a heading machine, the combination of:

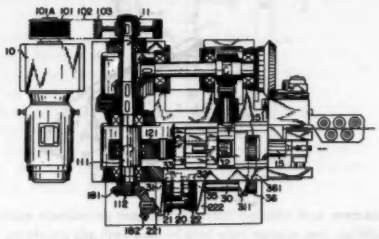
a source of power;

an eccentric shaft operatively connected to be driven by said source of power;

a connecting rod operatively connected to said eccentric shaft;

a rotary die head, including a plurality of dies, actuated by said connecting rod;

an intermittent rotary feeding means operatively connected to said eccentric shaft for providing an intermittent rotary motion to said rotary die head, said feeding means including an epicyclic train of gears, a driving shaft, a driven shaft, and at least two pairs of gears arranged so that said epicyclic train of gears is connected by said two pairs of gears at an equal center-to-center distance between said driving shaft and said driven shaft, at least one pair of said



two pairs of gears being cam gears which cooperate with said epicyclic train of gears to produce a differential speed which causes a variation in the meshing diameters of a pair of said pairs of gears, whereupon an intermittent rotary movement of a predetermined pitch is obtained from the intermittent dwell-and-move action of the drive shaft; and

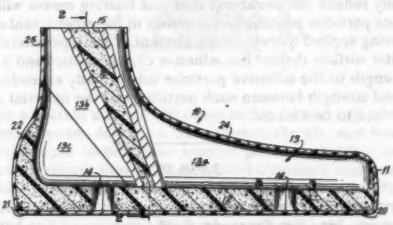
linking means coacting with said feeding means for further feeding the intermittent rotary motion to the rotary die head.

3,958,291

OUTER SHELL CONSTRUCTION FOR BOOT AND METHOD OF FORMING SAME

I. Martin Spier, 50 Park Ave., New York, N.Y. 10016

Filed Oct. 18, 1974, Ser. No. 516,044
Int. Cl.² A43D *9/00*, *65/00*
U.S. Cl. 12—142 RS **7 Claims**



1. A method for forming an outer shell construction for a boot comprising the steps of injection molding an outer shell, releasably securing a collapsible core to the inside of said outer shell molding and spaced therefrom to define a cavity between said outer shell and said collapsible core, said collapsible core including a conduit therethrough, introducing a cellular polymer in viscous form through said conduit into said cavity and curing said cellular polymer whereby said cured cellular polymer and outer shell molding define a boot outer shell construction.

3,958,292

ROLLER FOR CLEANING PHONOGRAPH RECORDS

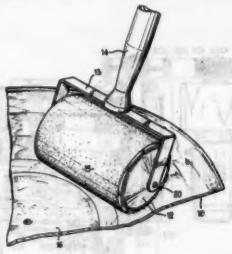
Cecil Powell, Hazel Grove, England, assignor to Milty Products Limited, Stockport, England

Filed Dec. 26, 1974, Ser. No. 536,647

Claims priority, application United Kingdom, Nov. 11, 1974, 48676/74

Int. Cl.² A47L 25/00; G11B 3/58

U.S. Cl. 15—104 A 2 Claims



1. A device for cleaning a gramophone record in a manner such that the likelihood of producing particles which are potentially dangerous to the record is substantially reduced, comprising: a cylindrical sleeve; a respective end closure at each end of such sleeve; bracket having two opposed, substantially parallel limbs thereon by and between which the sleeve is rotatably supported; a handle attached to the bracket; bearing means between each limb of the bracket and a respective end closure; each bearing means having a bush fixedly secured to the end closure, a headed stud having a body which is rotatably engaged within a bore in the said bush, the stud head extending outwardly from the end closure, and seating means on each limb of the bracket in which that end of the stud head which is remote from said end closure is fixedly secured for rotatably securing the bracket to the cylindrical sleeve, there being a protective flange on the bush located between the end cover and the stud head and extending radially outwardly therefrom and in contact with the outer surface of the end closure thereby effectively to seal the bearing, said stud head engaging said flange and said stud body being engaged in said bush bore in a manner such that wear created particles are essentially avoided and to cooperate with said seal to substantially reduce the likelihood that said bearing means will produce particles potentially dangerous to the record; said sleeve having applied thereto a tape element of the type wherein the outer surface thereof has adhesive characteristics and a bond strength to the adhesive particles substantially exceeding the bond strength between such particles and the material of the surface to be cleaned.

3,958,293

PIPE CLEANING MACHINE

Lawrence F. Irwin, Calabasas Park, Calif., assignor to Auger-scope, Inc., San Fernando, Calif.

Filed Aug. 26, 1974, Ser. No. 500,499

Int. Cl.² B08B 9/02

U.S. Cl. 15—104.3 SN 7 Claims

1. A pipe cleaning machine of the type characterized by having an elongated flexible plumbers snake or spring formed by helically wound spring wire which is stored within the machine in a coiled configuration and can be withdrawn forwardly of the machine for insertion into the pipe to be cleaned, comprising:

a. a frame;

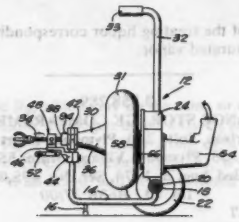
b. a one-piece spring housing rotatably mounted on said frame including;

1. a generally annular shaped rear portion adapted to contain the spring in a coiled configuration; and

2. a generally frustoconically shaped forward guide portion in communication with said rear portion and adapted to accommodate passage of the spring therethrough;

c. drive means for rotating said spring housing;

d. torque reaction means cooperatively associated with said housing for engagement with the spring to guide the movement of the spring within said housing during its withdrawal from the machine, said means being rotatably mounted within said housing for relative rotation therewith about the axis of rotation thereof and so constructed and arranged to cooperate with said housing during withdrawal of the spring to define a spring constraining passageway of a size to permit free passage of the spring but prevent the spring from kinking or back-looping in response to torque build-up therewith during withdrawal from the machine, said torque reaction means comprising a generally frustoconically shaped torque reaction element rotatably mounted on said frame within said housing said element being provided with at least one axially extending spring receiving groove for guidably engaging the spring; and



e. feed means mounted on said frame forwardly of said spring housing for receiving the spring as it passes forwardly through the forward guide portion of said spring housing and releasably gripping it to urge axial movement of the spring upon rotation of said housing.

3,958,294

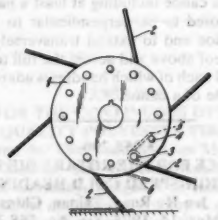
ROTARY SCRAPER

David E. Thompson, Norwalk, Conn., assignor to The Thompson Tool Co., Inc., Norwalk, Conn.

Filed Aug. 23, 1974, Ser. No. 500,031

Int. Cl.² A46D 9/02, 13/00

U.S. Cl. 15—198 3 Claims



1. A rotary scraper comprising

a. a hub

b. a plurality of elastically flexible fingers pivotably attached to the hub extending outwardly therefrom

c. restraining means fixed to the hub and located adjacent said pivotably attached fingers in a direction opposite to the direction of rotation, said restraining means including

means integral with said fingers and resting on said restraining means for preventing a true radial extension of the fingers from the hub

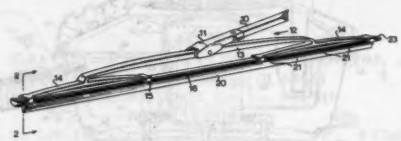
wherein a rotation of the hub about its central axis proximate to a work surface causes the outward tips of the fingers to flexibly impinge the work surface at a point substantially removed from the projection of the hub axis onto the work surface.

3,958,295

BACKING MEMBERS FOR USE IN WINDSHIELD WIPERS

Donald M. Green, Burlington, and George R. McDonald, Mississauga, both of Canada, assignors to Tridon Limited, Burlington, Canada

Filed Oct. 3, 1972, Ser. No. 294,716
Int. Cl. B60s 1/38
U.S. Cl. 15—250.39 **4 Claims**



1. In a windshield wiper assembly comprising a backing member, a squeegee whose length can be reduced by severing thereof retained and supported by the backing member, and a superstructure to which the backing member is attached, a backing member consisting of an elongated body of uniform cross-section along its length having a first channel extending along its length for the retaining reception therein of the said squeegee by endwise movement of the squeegee into the channel through one end of the backing member, and having opposed second and third channels extending parallel to the first channel for the reception of longitudinally spaced pairs of opposed claws of said superstructure by feeding the said one end of the backing member between the opposed claws of each pair thereof, the said backing member being provided at predetermined positions along its length with breakage indications for shortening of the backing member to a corresponding required length, removable stop means at the said one end of the backing member closing the respective ends of the three channels both before and after shortening of the backing member, and stop means at the other end of the backing member closing the respective other ends of the three channels.

3,958,296

AIR FILTER CLEANER

Albert J. Fell, 1450 West Chester Pike, West Chester, Pa. 19380

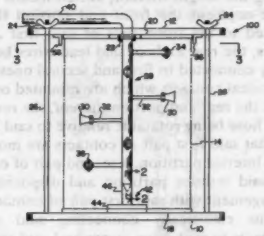
Filed Feb. 19, 1975, Ser. No. 551,181
Int. Cl.² A47L 5/14
U.S. Cl. 15—304 **5 Claims**

1. A portable air filter cleaner for cleaning an annular air filter, comprising:

a first closure member having a continuous surface defined within an outer periphery for supporting one end of the annular shaped air filter to be cleaned, said first member being provided for substantially sealing said one end of the annular shaped air filter during cleaning;

a second closure member having a substantially continuous surface defined within an outer periphery being mountable over the annular shaped filter to be cleaned, said second member being provided for substantially sealing the other end of the annular shaped filter during cleaning;

pipe means rotatably mounted substantially perpendicular to said second member by a rotatable sealed joint and terminating near said first member at a free end thereof, said pipe means being mounted on said second member so that it is substantially centrally located in the filter during cleaning, said pipe means being provided with a plurality of radially extending nozzles substantially equally spaced about the periphery of said pipe means, and spaced along said pipe means and at least one nozzle extending outwardly from the pipe means and including an outer portion extending at an angle to a radial in the plane formed by revolution to a radial about said pipe means to cause said pipe means to rotate;



a rotation stabilizing means mounted on said first member for receiving the free end of said pipe means and stabilizing its rotation;

means for connecting compressed air to said pipe means through said second closure member; and

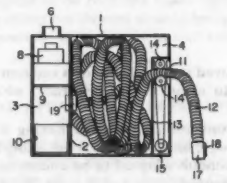
means for connecting said first member and said second member for contact with opposed open ends of the air filter to be cleaned.

3,958,297

SUCTION CLEANER

Hiroshi Hukuba, Nagareyama; Iwao Ikegami, Ichikawa, and Teruaki Yasuda, Tokorozawa, all of Japan, assignors to Kabushiki Kaisha Hukuba Future Research, Nagareyama, Japan

Filed Apr. 17, 1974, Ser. No. 461,783
Claims priority, application Japan, Apr. 28, 1973, 48-48870
Int. Cl.² A47L 5/38
U.S. Cl. 15—315 **5 Claims**



5. In a suction cleaner, the combination comprising:

housing means defining a compartment therein, said housing means including an interior partition dividing said compartment into first and second chambers, said interior partition having a first opening therein providing communication between said first and second chambers, and said housing means having a second opening formed therein and communicating with said second chamber;

suction means, filter means and dust receiving means disposed in said first chamber;

an elongated flexible suction hose stored within said second chamber in a random manner, said suction hose having the front end portion thereof projecting outwardly through said second opening, the rear end portion of said hose being associated with said first opening so that said hose communicates with said first chamber;

connecting means coacting between said inerior partition and the rear end portion of said hose for axially anchoring the rear end portion of said hose to said interior partition;

drive means for causing said hose to be paid out or hauled in through said second opening, said drive means including a drive motor drivingly connected to a reversible rotatable roller rotatably supported adjacent said second opening and positioned for engagement with said hose for causing said hose to be paid out or hauled in through said second opening depending upon the direction of rotation of said roller; and

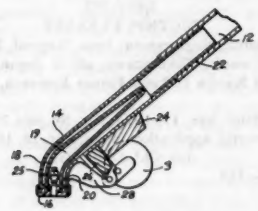
first and second electrical lead wires provided on the hose along the length thereof, switch means mounted on the hose adjacent the front end portion thereof and connected to the front ends of said first and second lead wires, the rear ends of said lead wires being correspondingly connected to first and second ones of a first pair of electrical contacts which are mounted on said hose adjacent the rear end portion thereof, the rear end portion of said hose being rotatable relative to said interior partition so that said first pair of contacts are movable relative to said interior partition, a second pair of contacts provided on said interior partition and disposed for continuous engagement with said first pair of contacts, and circuitry means electrically connecting said second pair of contacts to said drive motor and said suction means.

3,958,298

CLEANING NOZZLE

Bernard M. Cannan, Downers Grove, Ill., assignor to Servicemaster Industries Inc., Downers Grove, Ill.

Filed Aug. 1, 1974, Ser. No. 493,747
Int. Cl.² A47L 7/00
U.S. Cl. 15—322 **10 Claims**



1. An improved suction head for a vacuum cleaning apparatus adapted to clean a soiled surface, which comprises in combination:

a surface-contacting glide shoe having a leading edge, a trailing edge, and a bottom, contacting face;

a vacuum conduit adapted to be connected at one end to a vacuum source;

said glide shoe having spaced apart slots positioned on the bottom face of the shoe, one slot positioned adjacent to the leading edge of the shoe, and another slot positioned adjacent to the trailing edge of the shoe with an intermediate opening between the slots;

said slots being in fluid communication with the vacuum conduit.

nozzle means for discharge of a fluid through the intermediate opening onto the subjacent surface, said nozzle means being positioned between the spaced apart slots and above the bottom face of the shoe;

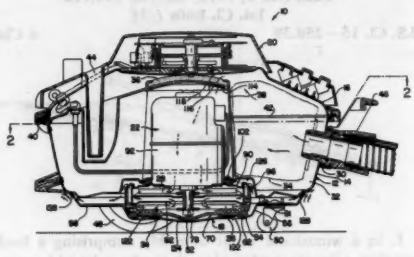
means for supplying cleaning fluid to said means located above said bottom face for communicating the intermediate opening with ambient air through the above the bottom face through the interior of the suction head, to permit air to flow in the direction of discharge of the cleaning fluid and between said slots to the intermediate opening to provide external air flow into said slots from the exterior of the head and from the intermediate opening, whereby the accumulation of grit and other material in the region between the slots and the intermediate opening is prevented.

3,958,299

AUXILIARY AIR COOLING SYSTEM FOR CANISTER CLEANERS

Donald B. Tschudy, Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio

Division of Ser. No. 397,149, Sept. 13, 1973, Pat. No. 3,874,023. This application June 24, 1974, Ser. No. 482,020
Int. Cl.² A47L 7/06, 9/22
U.S. Cl. 15—327 A **4 Claims**



1. A floor care appliance having an auxiliary, cooling air flow for reducing air discharge temperature from said floor care appliance including;

a. a mounting plate means for supporting said floor care appliance, said mounting plate means being generally pan shaped and extending generally horizontally,

b. a diffuser mounted with said mounting plate means and extending generally horizontally,

c. a fan means situated in and supported by said diffuser and discharging hot main stream cleaner air to said diffuser,

d. said diffuser being in the general shape of a horizontally extending disk,

e. said disk shape of said diffuser having vertically upwardly opening apertures extending therethrough for the introduction of an induced, cooling flow of ambient air, said ambient air directly mixing with said hot main stream cleaner air being discharged from said fan means whereby the combined stream of air has a lowered, more acceptable discharge temperature,

f. a resilient, compressible sealing element disposed between said mounting plate means and said diffuser and abutting said diffuser for positively resiliently supporting said diffuser and said fan means spacedly above said mounting plate means by being compressed between said diffuser and said mounting plate means,

g. said diffuser and said mounting plate means forming at least portions of a passageway therebetween only for the passage of said cooling air flow, said resilient, compressible sealing element sealing said passageway, and

h. said cooling air flow receiving entrance to said floor care appliance through means formed at least partly by said mounting plate means.

3,958,300

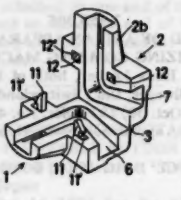
PLASTIC DEVICE FOR CLAMPING AND HOLDING A LENGTH OF ELECTRIC CORD

Toshie Tanaka, Machida, Japan, assignor to Nifco Inc., Tokyo, Japan

Filed Oct. 10, 1975, Ser. No. 621,444
Int. Cl.² F16L 5/00
U.S. Cl. 16—2 **4 Claims**

1. A plastic device for clamping and holding a length of electric cord comprising two L-shaped counterparts hinge-

connected to each other along one leg of the L-shaped counterparts, each counterpart having an L-shaped groove on the



inner flat surface thereof and a raised catch portion of the outer surface of the other leg of the L-shaped counterpart.

3,958,301

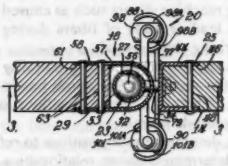
GRAVITY-ACTUATOR CLOSURE HARDWARE

John Janci, 1125 N. Karlov, Chicago, Ill. 60651

Filed Nov. 15, 1974, Ser. No. 524,110

Int. Cl.² E05F *1/06*

U.S. Cl. 16—152 **6 Claims**



1. Closure hardware adapted to mount swingably a closure in a vertical disposition to a support frame defining a vertical opening to enable the closure to swing between an open position out of the plane of the opening and a closed position disposed within the plane of the opening, comprising:

an upper universal mounting device adapted to mount the top edge of the closure at a corner portion thereof to the frame to support swingably and universally the closure from the frame about a point disposed within the plane of the opening so that the closure disposed normally at rest in the closed position can swing out of the plane of the opening and the lower portion of the closure can tilt upwardly relative to the upper portion thereof; and

a lower universal mounting device adapted to mount the side edge of the closure near the bottom edge thereof below said upper device to the adjacent portion of the frame to cause the lower portion of the closure to swing about a point outside of the plane of the opening and to cause the lower portion of the closure to tilt upwardly as the closure swings open so that when the closure is released from its open position, it falls from its open position under the force of gravity to its closed position.

3,958,302

APPARATUS FOR OPENING THE BODY CAVITY OF A FOWL

Pieter Meyn, Noordeinde 72, Oostzaan, Netherlands

Filed June 28, 1974, Ser. No. 484,466

Claims priority, application Netherlands, Nov. 9, 1973, 7315347

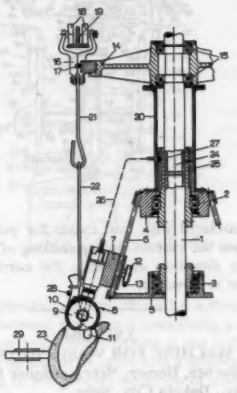
Int. Cl.² A22C *21/00*

U.S. Cl. 17—11 **2 Claims**

1. In an installation for processing slaughtered poultry, including a conveyor, a plurality of hangers attached to said conveyor, and a plurality of hooks each adapted to be suspended on one of the said hangers and to carry a fowl by its ankle joints:

apparatus for opening the body cavity of a fowl of which the vent has been cut out and which is depending from one of the said hooks, comprising:

a driving wheel rotatable about a vertical axis and provided with circumferential notches successively engaged by the said hangers so that it rotates in synchronism with said conveyor, at least one inclined guide track coupled with said driving wheel so as to rotate together with the same, a guide block reciprocable along said guide track, a housing connected with said slide block, a circular knife rotatably mounted in said housing and partially exposed by the same, means for rotating said knife about an axis substantially extending in the direction of movement of said conveyor, a cam follower on said slide block, a cam rail engaged by said cam follower, whereby said slide block is displaced to bring said knife into engagement with the fowl, a positioning member attached to said housing, and a ball-shaped protrusion at the end of said positioning member adapted to be received in the opening made in the fowl by cutting out its vent so as to bring the fowl into the proper position with respect to said knife.



3,958,303

METHOD AND APPARATUS FOR POULTRY VENT REMOVAL

Donald Joseph Scheier; Homer Augusta Haynes, both of Kansas City; J. D. Hawthorn, Independence, and Henry Evans Frederick, Parkville, all of Mo., assignors to Gordon Johnson Company, Kansas City, Mo.

Filed Dec. 16, 1974, Ser. No. 532,826

Int. Cl.² A22B *3/08*

U.S. Cl. 17—11.1 R **21 Claims**

1. Apparatus for removing the vent from a poultry carcass including:

a conveyor for advancing a number of carcasses along a predetermined path of travel;

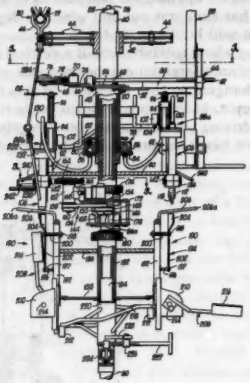
a series of hangers carried by said conveyor for suspending the carcasses in succession from the conveyor as they are advanced;

at least one carriage movable along its own path of travel disposed to intersect that of the carcasses for advancement of the carriage and an adjacent carcass together,

said carriage being provided with means for locating a carcass on the carriage in position for processing while the carriage and carcass advance together;

a cutter mounted for movement with said carriage and supported for reciprocation relative to the latter for cutting the vent from the carcass on the carriage during

shifting of the cutter in one direction as advancement continues; and



means associated with said cutter for pulling the severed vent from the carcass during shifting of the cutter in the opposite direction and while the carriage and carcass continue to advance.

3,958,304

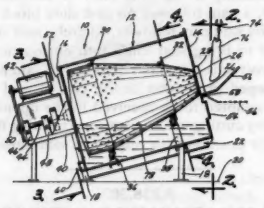
MACHINE FOR WASHING TRIPE

Wilford O. Barbee, Homer, Nebr., assignor to Iowa Beef Processors, Inc., Dakota City, Nebr.

Filed Apr. 9, 1973, Ser. No. 349,538

Int. Cl.² A22C *17/14*

U.S. Cl. 17—43 **2 Claims**



1. A machine for washing tripe comprising,

an inclined cylindrical housing having upper and lower ends and having an access opening in the upper end thereof;

a perforated drum rotatably mounted in an inclined position in said housing and having upper and lower ends, said drum having an intake-discharge opening formed in its upper end which is in communication with said access opening of said housing, said drum substantially having its diameter tapered inwardly from its lower end to its upper end,

power means for selectively rotating said drum in opposite directions,

perforated baffle elements spirally positioned and secured to the interior of said drum for agitating tripe in said drum when said drum is rotated in one direction, and for discharging the tripe from said drum when said drum is rotated in a direction opposite to said one direction,

means for supplying washing liquid to the interior of said housing,

at least a portion of the lower end of said drum being submerged in the liquid provided by said means for supplying washing liquid without also having said intake discharge opening in said drum submerged in liquid,

said drum being perforated at its lower end to permit washing fluid in said housing to freely enter said drum.

3,958,305

METHOD OF AND AN APPARATUS FOR UNIFORMALIZING COMBING MACHINE SLIVERS

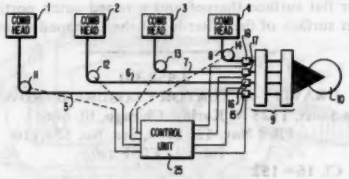
Ernst Felix, and Hans Locher, both of Uster, Switzerland, assignors to Zellweger, Ltd., Switzerland

Filed Oct. 30, 1973, Ser. No. 411,177

Claims priority, application Switzerland, Oct. 30, 1972, 15796/72

Int. Cl.² D01G *19/00*; D01H *5/38*

U.S. Cl. 19—215 **14 Claims**



1. A method for compensating the density fluctuation periods in combing machine slivers such as caused by piecing up the trailing and leading ends of fibers during the combing operation comprising the steps of

measuring the density of each of a plurality of slivers derived from the output of the comb heads of a combing machine to detect the phase positions of the density fluctuation periods therein,

comparing the detected phase positions to reference values having predetermined phase relationships to determine respective misalignment errors in the detected phase positions,

adjusting the relative positions of the respective slivers to place the density fluctuation periods in each sliver out of phase with the density fluctuation periods in the other slivers by a predetermined value, in response to the respective misalignment errors, and

drafting the adjusted slivers.

3,958,306

UMBRELLA FASTENER

Tarja Kuusisto, New York, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Nov. 18, 1974, Ser. No. 524,542

Int. Cl.² A44B *21/00*; A45C *1/04*

U.S. Cl. 24—73 CS **3 Claims**

1. An umbrella fastener comprising:

a tapered hollow truncated cylinder formed of a flat spirally wound band of a diameter and taper substantially equivalent to a diameter and taper of an umbrella, whereby when the umbrella fastener is set in place around the umbrella and moved toward an end of the umbrella the

ribs of the umbrella and the cloth of the umbrella are tightly and evenly contracted together and the umbrella kept securely and neatly closed;

a flexible chain attached to one end of the cylinder; and

a handle attached to the other end of the flexible chain, thereby enabling a person to hold the umbrella in a pendant type manner.

3,958,307

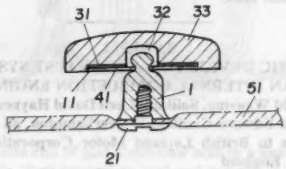
BUTTON ASSEMBLY WITH ROTATABLE AND PIVOTABLE BUTTON

Hidenosuke Ishizaki, 6-13, 6-chome, Motoyamakita, Higashinada, Kobe, Japan

Filed Oct. 16, 1974, Ser. No. 515,199

Int. Cl.² A44B *1/38, 17/00*

U.S. Cl. 24—108 **2 Claims**



1. A button assembly with a rotatable and pivotable button, comprising a button leg body having a base end for bearing against a fabric and having an oppositely disposed outer end, a screw-threaded bore formed coaxially in said leg body and opening into the base end thereof, a screw member having a head and a screw-threaded portion for passing through a fabric and screwing into said bore such that a fabric can be tightly embraced between said base end and said screw head to detachably fasten said leg body to a fabric with the leg body standing proud from the plane of the fabric, the outer end portion of said leg body being formed with a relatively constricted neck between a relatively outwardly located head portion and a relatively inwardly located shoulder portion, said shoulder portion being proximate said head portion, the diameters of the head portion and shoulder portion being larger than the diameter of said constricted neck, and the surfaces of said shoulder portion and said head portion adjacent said constricted neck being angled away from said constricted neck to facilitate free pivotal movement of said button body, a button body having a hollow portion on one face thereof and a support plate mounted on said one face, said support plate having an aperture aligned with said hollow portion and surrounding said constricted neck of said leg body such that the portion of said support plate relatively adjacent said aperture is supported by said shoulder portion of said leg body and the head portion of said leg body is disposed with substantial clearance in said hollow portion of said button body, the diameter of said support plate aperture being smaller than the diameters of said head and shoulder portions but larger than the diameter of said constricted neck such that said button body is coupled to said leg body but is free to rotate about the longitudinal axis of said leg body and pivot about pivot axis coincident with any diametric cord passing through said constricted neck normally to said longitudinal axis of said leg body, said leg body being of elongate configuration such that said constricted neck and shoulder portion and the support plate mounted thereon are substantially removed from said base end to ensure substantial clearance for said pivotal movement of said button body even when the assembly is mounted on a fabric, said support plate being formed with at least one cut extending from the periphery of said aperture to render the aperture enlargeable and to thereby permit said head portion to be forced therethrough in either direction, whereby said button body is readily attachable to and detachable from said leg body, and said button body is free to rotate and pivot through substantial angles to facilitate buttoning and unbottoning in cooperation with a button hole.

3,958,308

QUICK-RELEASE FASTENERS

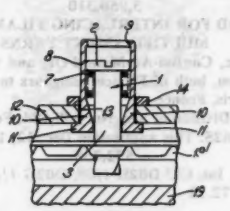
Trevor F. J. Gooding, Guildford, England, assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Filed Mar. 21, 1975, Ser. No. 560,347

Claims priority, application United Kingdom, Apr. 29, 1974, 18644/74

Int. Cl.² A44B *17/00*

U.S. Cl. 24—221 K **3 Claims**



1. A resilient plastics retaining sleeve for a stud assembly of a quick release fastener, said sleeve comprising a substantially cylindrical portion, said portion having at one end an inwardly directed annular lip and at its other end a shoulder and a pair of legs extending in the general direction of said sleeve axis, each of said legs having at its free end an outwardly directed flange, whereby, in use, said legs may be brought together and inserted through an aperture in a panel on which said sleeve is to be mounted, said legs springing outwards again after insertion, as a result of their resilient nature, said leg flanges then engaging said rear surface of said panel to retain said sleeve thereon, said shoulder engaging said front surface of said panel to prevent said cylindrical portion of said sleeve passing through said aperture, and said legs having a greater thickness than the cylindrical portion to strengthen the legs and to prevent them from breaking or buckling when the sleeve is subjected to an outward pull and to form a guideway for a stud.

3,958,309

MOTORIZED EXPANDER FOR ONE, TWO OR MORE CLOTH WIDTH

Fulvio Conti, Via Carnovali, 88, 24100 Bergamo, Italy

Filed Aug. 7, 1974, Ser. No. 495,499

Claims priority, application Italy, Sept. 27, 1973, 29472/73

Int. Cl.² D06C *3/06*

U.S. Cl. 26—105 **3 Claims**

1. A motorized expander comprising a drive shaft, at least two cylinders arranged on said shaft, said two cylinders being fixedly connected to said shaft for rotation therewith and being spaced from one another, a further cylinder idly mounted on said shaft between each of said at least two cylinders and spaced therefrom, a clutch, arranged in at least one of the spaces defined between each of said at least two cylinders and said further cylinder, for transmitting rotary motion

from said shaft to said further cylinder, said further cylinder having a spiralled surface with a pair of opposite handed spirals thereon and each of said at least two cylinders having a spiralled surface with a single spiral opposite handed to the respective adjacent spiral of said further cylinder, and activating means for activating said clutch to cause said further cylinder to rotate with said at least two cylinders, thereby defining an expander suitable for one or more fabrics of normal width, and for disactivating said clutch to cause said further cylinder to rotate relative to said shaft and said at least two cylinders, thereby defining an expander suitable for a fabric having a multiple width.

3,958,310

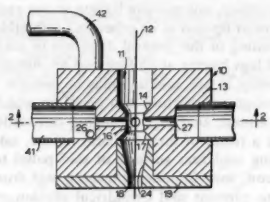
METHOD FOR INTERLACING FILAMENTS OF MULTIFILAMENT YARNS

Charles Blanc, Couzon-Au-Mont-d'Or, and Christian DeLarue, Meyzieu, both of France, assignors to Rhone-Poulenc-Textile, Paris, France

No Drawing. Division of Ser. No. 438,684, Feb. 1, 1974, Pat. No. 3,875,625. This application Dec. 12, 1974, Ser. No. 532,238

Int. Cl.² D02H *1/08*; D02G *1/16*

U.S. Cl. 28—72.12 **2 Claims**



1. A method of interlacing multifilament yarn by utilizing expanding fluid comprising the steps of:

advancing the yarn through a work station; and

impinging at least one jet of fluid on the yarn from a direction normal to the direction of advance of the yarn wherein the fluid has a rotational component imparted thereto before impinging on the yarn, wherein the axis of the rotational component is normal to the direction of advance of the yarn.

3,958,311

METHOD OF MAKING A GROOVED ROLLER

Eduard Küsters, Krefeld-Forstwald, and Valentin Appenzeller, Kempen, Ndrh., both of Germany, assignors to Edüard Küsters, Krefeld, Germany

Division of Ser. No. 365,611, May 31, 1973, Pat. No. 3,845,534. This application Apr. 8, 1974, Ser. No. 458,814

Claims priority, application Germany, June 6, 1972, 2227356

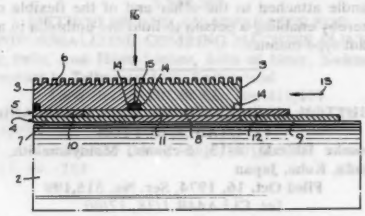
Int. Cl.² B21D *53/12*; B21H *1/12*, *1/14*; B21K *1/02*

U.S. Cl. 29—148.4 D **3 Claims**

1. A method of manufacturing a roller having a corrosion-free outer metal working surface for use in the manufacture of paper, cardboard, or the like, comprising the steps of:

a. forming a plurality of sleeves of a corrosion-free metal, each sleeve having a plurality of annular grooves on the exterior surface thereof; and

b. mounting said sleeves axially adjacent to one another on a cylindrical metal core by heating said sleeves prior to



mounting and sequentially heat shrinking said sleeves onto said core.

3,958,312

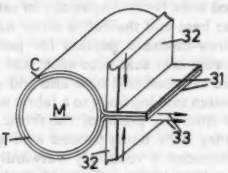
CATALYTIC DEVICE FOR AN EXHAUST SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

John Harold Weaving, Solihull; Cecil David Haynes, Nuneaton, and John Edward Caulton, Wolverhampton, all of England, assignors to British Leyland Motor Corporation Limited, London, England

Filed Jan. 18, 1974, Ser. No. 434,542

Int. Cl.² B01J *8/02*; B21D *39/02*; B23P *15/26*; F01N *3/15*

U.S. Cl. 29—157 R **4 Claims**



1. A method of fabricating a catalytic device for an exhaust system for an internal combustion engine comprises the steps of:

1. disposing a layer of thermal insulating material about the periphery of a unitary refractory catalyst support member;

2. disposing around the member and the layer a sheet of casing material;

3. contiguously juxtaposing the ends of the sheet of casing material, applying tension to the juxtaposed ends of the material to draw them away from the layered member while squeezing the tensioned ends together in the vicinity of and tangentially to the layered member to tension the sheet and compress the layer substantially uniformly; and

4. securing the sheet to itself to provide a gas tight enclosure about the member.

3,958,313

METHOD, APPARATUS AND PRODUCT FOR IMPROVED PIPE-TO-MANHOLE SEALING

John C. Rossborough, Amherst, N.H., assignor to Merchants National Bank of Manchester, Manchester, N.H.

Filed June 5, 1974, Ser. No. 476,476

Int. Cl.² F16L *3/04*, *5/02*, *21/08*

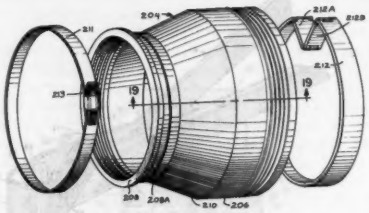
U.S. Cl. 29—157 R **16 Claims**

1. A method of yieldably and flexibly connecting a section of sewer pipe into a side wall of a manhole riser, vertically disposed in a sewer line trench, in which the sewer pipe is

received at one side thereof, by means of a flexible tubular connector boot, said method comprising the steps of:

determining a point of reference on the outer surface of the manhole riser through which the central longitudinal axis of the sewer pipe is to be located;

core drilling the reinforced concrete wall of said riser along a circular path of coring, whose centre coincides with the said point of reference, to form a sewer pipe porthole, of predetermined greater diameter than the diameter of said pipe, defined by an exposed, smooth, circular edge surface;



inserting one end of said connector boot in a loose fit in said porthole, then expanding said end radially in a direction normal to the axis of said porthole and internally clamping said expanded end against the smooth surface of said porthole to seal the same;

then inserting the inner end of said section of sewer pipe into said boot and inside the pipe porthole, and then externally clamping the opposite end of said boot around said pipe section.

3,958,314

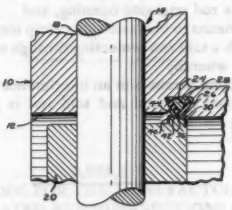
SEAL FOR BUTTERFLY VALVES

Gregory A. Kurkjian, Jr., Wheaton, Ill., assignor to Henry Pratt Company, Aurora, Ill.

Division of Ser. No. 363,885, May 25, 1973, abandoned. This application July 11, 1974, Ser. No. 487,434

Int. Cl.² B23P 15/00; F16K 1/226

U.S. Cl. 29—157.1 R **7 Claims**



1. A method of fabricating a valve having a valve body provided with an opening through which fluid may pass, a valve member rotatable within the opening and positionable therein to control the flow of fluid therethrough; a peripheral lip on one of the valve member and the opening and a valve seat on the other of the valve member and the opening, comprising the steps of providing a valve body having a fluid flow opening; providing a valve member for rotatable disposition in said opening to control fluid flow; providing a peripheral lip on one, and a valve seat on the other of the valve member and the opening; forming a channel shaped strip having a concave surface out of corrosion resistant sheet material; placing the strip about the peripheral lip such that the lip enters the concave surface of the channel and with the ends of the strip in abutting relation; and thereafter securing the ends of the strip to each other.

3,958,315

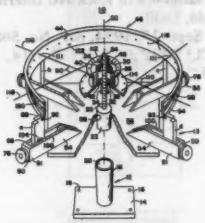
METHOD OF TIGHTENING SPOKES OF WIRE WHEELS

Gary W. Kinney, 2615 Scenic View Drive, Huntsville, Ala. 35810

Continuation-in-part of Ser. No. 513,843, Oct. 10, 1974. This application Sept. 29, 1975, Ser. No. 617,501

Int. Cl.² B21K 1/34

U.S. Cl. 29—159.02 **1 Claim**



1. A method of tightening spokes of spoke-type wheels comprising the following steps:

tightening said spokes in a plurality of sequences wherein each spoke is tightened in each sequence, the nipples being tightened in the first sequence to a finger-tight position, and thereafter in each sequence the nipples of the spokes turned an equal amount representative of a fraction of tightening necessary for full tightening; and

the spokes being tightened in groups of adjacent spokes, where spokes are attached to the rim, and wherein the order of tightening in each sequence is:

tightening first and second groups of oppositely positioned spokes,

tightening third and fourth oppositely positioned groups of spokes, said third and fourth groups being rotationally located substantially 90° from said first and second groups,

tightening fifth and sixth oppositely positioned groups of spokes, said groups being rotationally located substantially 45° from said first and second groups, and

tightening seventh and eighth oppositely positioned groups of spokes, said groups being rotationally located substantially 90° from said fifth and sixth groups.

3,958,316

LIQUID PHASE-SINTERED MOLYBDENUM BASE ALLOYS HAVING ADDITIVES AND SHAPING MEMBERS MADE THEREFROM

Earl I. Larsen, Indianapolis, Ind., and Richard H. Krock, Weston, Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Division of Ser. No. 109,121, Jan. 25, 1971, abandoned. This application Nov. 29, 1973, Ser. No. 420,107

Int. Cl.² C22C 1/04

U.S. Cl. 29—182 **17 Claims**

1. A shaping member containing a sintered Mo base alloy consisting essentially of about 80 wt.% or more Mo, two metallic elements forming an alloy which when molten dissolves an appreciable amount of Mo, and a property improving element, the two metallic elements forming the alloy selected from one of the following groups consisting of (a) Mn and an additional element selected from the group consisting of Ni, Fe, Cu, Ti, Zr, U, Si and Co, (b) V and an additional element selected from the group consisting of Ni, Fe, Co, Mn and Cr, (c) Si and an additional element selected from the group consisting of Ni, Fe, Co, Cu and V, (d) B and an additional element selected from the group consisting of Ni, Fe, Co, Cr,

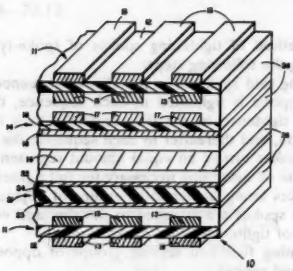
V, Nb and/or Ta, (e) Ni and an additional element selected from the group consisting of Fe, Co, Cr and Cu, and (f) Fe and Co, and the property improving element being different from the two metallic elements, the property improving element selected from the group consisting of Re, Ti, Zr, Hf, Co, Cr, Al, Cu, Ta, W, Nb, Ru, and B.

3,958,317

COPPER SURFACE TREATMENT FOR EPOXY BONDING

Leland L. Peart, San Clemente, and John S. Schiavo, Placentia, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 25, 1974, Ser. No. 508,933
Int. Cl.² B23P 3/20; B32B 3/14, 15/08
U.S. Cl. 29—195 7 Claims



1. A multilayer circuit board comprising:
an insulating substrate;
a copper member having first and second opposed surfaces, said first surface bonded to said insulating substrate;
an electrodeposited layer of chromium of approximately 10–20 microinches thickness on the second surface of said copper member,
said layer of chromium having a roughened surface; and
a layer of adhesive selected from the group consisting of epoxy adhesive, epoxy glass adhesive and polyimide adhesive bonded to the roughened surface of said chromium layer.

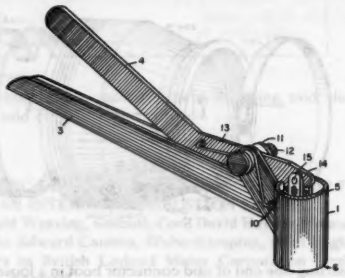
4. A multilayer circuit board comprising:
a first member of copper;
a second member selected from the group consisting of an insulating substrate and copper; and
means for bonding said first member to said second member, said means for bonding consisting essentially of:
an electrodeposited chromium coating of approximately 10–20 microinches thickness on said first member of copper,
said chromium coating having a roughened surface; and
a layer of adhesive selected from the group consisting of epoxy adhesive, epoxy glass adhesive and polyimide adhesive interposed between said first and second members and bonded to the roughened surface of said chromium coating.

3,958,318

FASTENER APPLYING TOOL

Valentin L. Crosa, Montevideo, Uruguay, assignor to H. K. Porter Co., Pittsburgh, Pa.

Continuation of Ser. No. 412,131, Nov. 13, 1973, Pat. No. 3,872,570. This application Feb. 5, 1975, Ser. No. 547,420
Claims priority, application Uruguay, Nov. 13, 1972, 19154
The portion of the term of this patent subsequent to Mar. 25, 1992, has been disclaimed.
Int. Cl.² B23P 19/04
U.S. Cl. 29—267 9 Claims



1. A tool for releasably gripping a rod comprising:
a support structure;
a rod clamping assembly connected to said structure and movable relative to said structure;
means for producing said relative movement; and
a release means connected to said structure and adapted to cooperate with said clamping assembly, when said clamping assembly and said structure are at one end of said relative movement, to release a said rod gripped by said clamping means;
wherein, upon operation of said means to produce said relative motion, away from said one end, a said rod, when gripped by said clamping assembly, is moved longitudinally relative to said structure; wherein the clamping assembly comprises:
a housing having an opening permitting projection of a said rod into said housing;
a split clamp means captively disposed in said housing and defining a rod engaging opening; and
a resilient means to bias said split clamp means into engagement with a said rod projecting through said rod engaging opening; whereby
said split clamp means is in an interference fit between said housing and said rod and said rod is gripped by said clamping assembly.

3,958,319

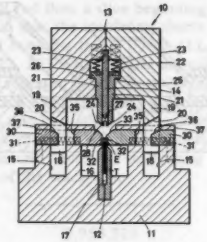
APPARATUS FOR PRODUCING ELEMENT-FREE GAPS IN A CONTINUOUS FASTENER CHAIN

Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Jan. 28, 1975, Ser. No. 544,892
Claims priority, application Japan, Jan. 31, 1974, 49-13200
Int. Cl.² B21D 53/52
U.S. Cl. 29—410 8 Claims

6. An apparatus for producing element-free gaps in a continuous fastener chain having a carrier tape carrying along one longitudinal edge a series of discrete fastener elements secured to a cord; said apparatus comprising a bed; a fastener chain support means on said bed and operable to support a lengthwise portion of the fastener chain with the coupling

heads of the fastener elements aligned with respect to a given plane; a pair of element holding means moveable transversely and oppositely relative to said plane and biased for engagement with respective opposite sides of said fastener elements to hold the fastener elements therebetween supported by said fastener chain support means; punch holding means disposed for reciprocal movement in said plane toward and away from said fastener chain support means; a punch means carried by



said punch holding means, said punch means including a cutting surface positioned to cut into said coupling heads and toward the cord to sever the fastener elements supported by the fastener chain support, and means engaging said cord to limit the advancement of said cutting surface to avoid cutting into said cord; and remover means carried by said punch holding means and operable in response to the movement thereof to remove the severed elements off from the fastener chain.

3,958,320

METHODS FOR THE MANUFACTURE OF PREFABRICATED BUILDING SECTIONS OR ROOM UNITS AND FACTORIES FOR THE IMPLEMENTATION OF SUCH METHODS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

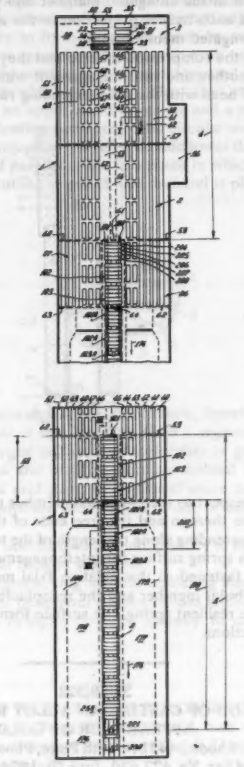
Filed Sept. 19, 1973, Ser. No. 398,867

Claims priority, application Netherlands, Sept. 19, 1972, 7212652

Int. Cl.[2] B23P *15/00, 19/04*; E04G *21/14*

U.S. Cl. 29—430 **32 Claims**

1. A method for the manufacture of prefabricated building sections on a production line, the method comprising the steps of fabricating panels along a manufacturing line of said production line, assembling prefabricated panels in an assembly station of said line into basically completed structural sections which comprise at least an assembled floor, two walls and ceiling or roof and employing an intermittently movable conveying mechanism which moves said structural sections from said assembly station to an assembly part of said line, continuously moving said structural sections through at least a substantial portion of said assembly part, and performing finishing



operations on said structural sections in said assembly part of said production line.

3,958,321

METHOD OF MAKING A SPRING WING STUD

Peter Schenk, West Islip, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Division of Ser. No. 482,139, June 24, 1974, Pat. No. 3,927,444. This application May 5, 1975, Ser. No. 574,533

Int. Cl.[2] B23P *11/02*

U.S. Cl. 29—446 **4 Claims**

1. A method of forming a stud for interengagement with a rigid receptacle to form a fastener assembly comprising:

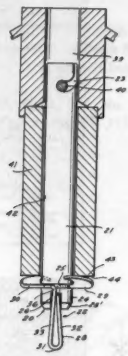
providing an elongated body member with a locking surface in one end thereof for interengagement with a locking portion of the receptacle so that relative rotation between the stud and receptacle causes relative axial movement therebetween as the locking surfaces move into the locked position and relative rotation in the opposite direction causes relative axial movement between the stud and receptacle as the locking surfaces move into the disengaging position to permit separation of the stud and receptacle;

locating a slot in the opposite end of the elongated body member and an annular groove adjacent the slot and spaced therefrom on the outer surface of the elongated member;

forming a wing portion and spring assembly for mounting on the elongated member by forming a U-shaped wing portion with opposing rectangular sides and a helical shaped projection extending from each side in an arcuate direction so as to terminate in a free end;

compressing the two opposed sides toward one another and inserting the open end of the wing portion into the slot in the end of the elongated member and postioning a portion of each helical projection in the annular groove in the elongated member; and

releasing the compressed sides so that they move away from one another and into engagement with surfaces in the slotted head with the sides extending radially and axially



with respect to the elongated member to form a gripping surface thereon and the free ends of the helical projections extending along the length of the tubular member to form a spring surface for interengagement with members being fastened so that relative axial movement between the tubular member and the receptacle will be absorbed by the resilient spring-like surface formed by the helical projections.

3,958,322

METHOD OF CASTING AN ALLOY HAVING THE APPEARANCE OF GOLD

William A. Rhodes, 4421 N. 13th Place, Phoenix, Ariz. 85014

Division of Ser. No. 477,620, June 10, 1974. This application June 19, 1975, Ser. No. 588,201

Int. Cl.[2] B22C *9/04*

U.S. Cl. 29—527.6 **4 Claims**

1. A method of investment casting an alloy comprising aluminum, copper and Indium, wherein: an investment mold is placed in a furnace with a wax cavity forming part therein; heating the mold to burn the wax part therefrom and whereby forming a cavity in said mold; reducing the temperature of the furnace to a temperature ranging between 700° and 800° Fahrenheit, then removing the mold from the furnace at such temperature and placing the mold in an autoclave which has been preheated to approximately 250° Fahrenheit and allowing said mold to normalize at said temperature of 250° Fahrenheit, then heating said alloy to a molten temperature of approximately 2000° Fahrenheit; then centrifugally casting said alloy into said mold while said mold is at a temperature of approximately 250° Fahrenheit.

3,958,323

THREE MASK SELF ALIGNED IGFET FABRICATION PROCESS

Francisco H. De La Moneda, Reston, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

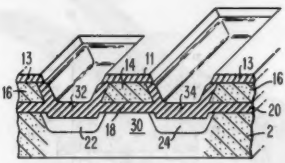
Filed Apr. 29, 1975, Ser. No. 572,805

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—571 **37 Claims**

1. In a process for making a field effect transistor device having a polycrystalline silicon gate, with a silicon substrate of a first conductivity type having deposited therein source and drain regions of a second conductivity type, with a gate insulator layer, a polycrystalline silicon layer, and an oxygen impervious layer, sequentially formed on the surface of said substrate, with openings in said layers over said source and drain regions, defining a gate region between said source and drain regions and a field region surrounding said source, gate, and drain regions, comprising the steps of:

growing a first silicon dioxide layer region on the exposed surfaces of said polycrystalline silicon layer in said gate region;



etching said oxygen impervious layer, forming a first oxygen impervious region over said gate region and exposing said polycrystalline silicon layer in said field region;

etching said polycrystalline silicon layer in said field region;

said polycrystalline silicon layer in said gate region being protected from etching by said first oxygen impervious region and said first silicon dioxide layer region;

etching to remove said first oxygen impervious region;

forming electrical contacts with said source and drain regions and said polycrystalline silicon gate region;

whereby an hermetically sealed insulated gate field effect transistor device can be made in an improved manner.

3,958,324

METHOD FOR THE MANUFACTURING OF THERMOELECTRIC MODULES

Michel Alais, and Andre Stahl, both of Orsay, France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jan. 22, 1975, Ser. No. 543,108

Claims priority, application France, Feb. 15, 1974, 74.05257

The portion of the term of this patent subsequent to Dec. 3, 1991, has been disclaimed.

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—573 **7 Claims**

1. Method for manufacturing thermoelectric modules from blocks of P type and of N type, having a parallelepipedical

shape and having the same dimensions, and including the steps of:

cutting each parallelepipedical block parallel to one of its faces into plates of P type and plates of N type;

assembling alternately the same number of plates of P type and of N type, after having inserted between the adjacent faces thereof very thin insulating sheets having the same dimensions as the plates, to form a stack (3);

cutting that stack into thin slices in a direction perpendicular to the faces of the P and N plates so as to form slices each composed of a series of rods of alternating P and N type;

forming a parallelepipedic stack by assembling in a parallel configuration a certain number of these slices, after having inserted between the adjacent faces thereof very thin insulating sheets, so as to place successively a slice beginning with a P rod then a slice beginning with an N rod;

characterized in that the insulating sheets (31); 32, 33, 34, 35) inserted between the P plates (11, 12, 13) and N plates (21, 22, 23) are arranged alternately so as to be substantially recessed in relation to the plates on one face (4) of the stack (3) and slightly protruding on the opposite face (5), and in that the said opposite faces (4, 5) of the said stack (3) from which the sheets (31, 32, 33, 34, 35) protrude are immersed in brazing material before said cutting of the stack (3).

3,958,325

METHOD AND APPARATUS FOR MAKING STATORS FOR ELECTRICAL MACHINES

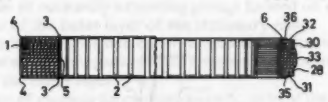
Manfred Rick, Stuttgart; Rolf Busch, Hildesheim; Klaus Renz, Stuttgart; Gunter Weber, Renningen; Werner Mann, Gerlingen; Helmut Schlaich, Rutesheim; Ernst Rohm, Fellbach; Rudeger Luders, Stuttgart, and Manfred Wilhelm, Nussdorf, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 3, 1974, Ser. No. 502,361

Claims priority, application Germany, Sept. 1, 1973, 2344193

Int. Cl.² H02K *15/00*

U.S. Cl. 29—596 **17 Claims**



1. A method of producing stators for electrical machines comprising the steps of forming an annular blank of interconnected metallic laminae having substantially cylindrical internal and external surfaces and being formed with radial slots extending outwardly from said internal surface thereof; subjecting the blank to a preliminary shaping operation to provide chamfers at the inner and outer surfaces at the opposite ends of the blank; and cold deforming the blank by compressing the same in axial direction while simultaneously radially expanding the same to a shape corresponding to that of the stator.

3,958,326

METHOD OF MANUFACTURING COMMUTATOR

Kazuo Matsumoto, Anjo, and Toshihiro Kobayashi, Gamagori, both of Japan, assignors to Nippondenso Co., Ltd., Japan

Filed Jan. 14, 1975, Ser. No. 540,797

Claims priority, application Japan, Mar. 3, 1974, 49-29531

Int. Cl.² H01R *43/08*

U.S. Cl. 29—597 **6 Claims**

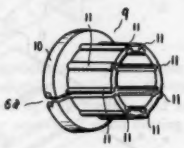
1. A method of manufacturing a commutator comprising the steps of;

preparing a straight length of metal with two ends, each end having a first and second tapered portion;

forming said straight length of metal into a circular commutator blank, said two ends being positioned adjacent each other, thereby to form a parallel space by said first tapered portions spaced in parallel with each other and to form a locating portion by said second tapered portions;

inserting said circular commutator blank into an extrusion press having an upper and a lower die and a mandrel;

locating said locating portion of said circular commutator blank on a projection provided on said lower die, thereby to locate said parallel space in a plane in which one of a plurality of cutting edges of said mandrel is placed;



extruding said circular commutator blank, thereby to elongate the metal of said blank to form a segment ring including a flanged portion and a plurality of gaps on the inside thereof and bridging portions formed across the outer ends of said gaps, said parallel space being elongated and positioned along a line of one of said bridging portions;

cutting radially said flanged portion, thereby to divide same into individual flanged segments;

molding said segment ring with an insulating material; and

cutting the outer peripheral surface of said segment ring to remove said bridging portions thereby to complete a commutator.

3,958,327

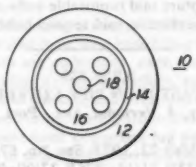
STABILIZED HIGH-FIELD SUPERCONDUCTOR

William G. Marancik; Frederick T. Ormand, both of Basking Ridge, and Eric Gregory, Chester, all of N.J., assignors to Airco, Inc., Montvale, N.J.

Filed May 1, 1974, Ser. No. 465,970

Int. Cl.² H01V *11/14*

U.S. Cl. 29—599 **3 Claims**



1. A stabilized high-field superconductor composite, comprising:

a bronze alloy matrix containing a plurality of parallel bores, wherein said alloy furnishes a metallic component of an A-15, Type II superconductive compound;

a plurality of metallic rods inserted into said bores, said rods being capable of reacting with said matrix during heat treatment at a predetermined reaction temperature to form said superconductive compound;

a sheath of normal material for stabilizing said composite surrounding said matrix; and

a barrier layer substantially impervious to diffusion by said alloy metallic component at temperatures up to and including said reaction temperature interposed between said normal material and said matrix, said barrier layer comprising at least two sectors wherein one said sector is

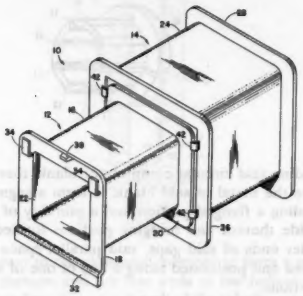
essentially of metal selected from the group consisting of niobium and vanadium, and a second said sector is essentially of a dissimilar metal that does not substantially react with said matrix.

3,958,328

METHOD OF MAKING A TRANSFORMER COIL ASSEMBLY

Harold E. Lee, Logansport, Ind., assignor to Essex International, Inc., Fort Wayne, Ind.

Filed June 2, 1975, Ser. No. 582,664
Int. Cl.² H01F *41/06*
U.S. Cl. 29—605 **2 Claims**



1. The method of making a coil assembly which comprises:
providing an elongate tubular form comprising first and second spool-like bobbin sections each having a core with an opening through the core of the second bobbin section being sized to receive the flanges of the first bobbin section, said first and second bobbin sections being in end-to-end relation with their respective longitudinal axes generally in alignment and with one flange of said first bobbin section integrally joined to one end of the core of said second bobbin section by thin rupturable webs;
winding a coil of insulated wire on at least said first bobbin section while said first and second bobbin sections remain connected by said rupturable webs; and
axially pressing one bobbin section toward the other bobbin section to rupture said rupturable webs and telescope said first bobbin section in said second bobbin section.

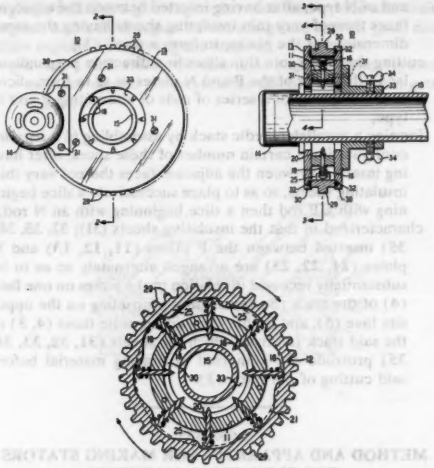
3,958,329

CAST IRON PIPE CUTTER

Philip W. Mundy, 4 Vermont Ave., Port Monmouth, N.J. 07758

Filed May 22, 1975, Ser. No. 579,857
Int. Cl.² B23D *21/12*; B26B *27/00*; B26D *3/16*
U.S. Cl. 30—97 **10 Claims**

1. In apparatus for cutting pipe, the combination comprising:
an inner ring having a plurality of spring-biased cutting pins disposed radially around it's perimeter in spoke-like relationship so as to form an aperture at their cutting tips adapted to accommodate the outer wall of the pipe to be cut, each of said cutting pins adapted to reciprocate in said inner ring and including a cutting tip, an anvil cap and means for urging said anvil cap away from said inner ring:
an outer ring disposed annularly with respect to said inner ring;
housing means for holding said rings in rotating relationship with each other, said holding means being adapted to hold one of said rings stationary with respect to said pipe to be cut;
motor means for rotating said rings relative to each other, and
cam means affixed to the inner periphery of said outer ring so as to strike the anvil cap on each of said cutting pins



on a point of percussion as said rings rotate relative to each other whereby the cutting tips on said cutting pins are driven against the outer wall of said pipe until fracture occurs.

3,958,330

KNIFE AND LOCKING SCABBARD

Douglas R. Hutchens, Tigard, Oreg., assignor to Gerber Legendary Blades, Portland, Oreg.

Filed May 21, 1975, Ser. No. 579,318
Int. Cl.² B26B *29/02*
U.S. Cl. 30—151 **11 Claims**

1. An interlocking knife and scabbard device which comprises in combination:
a knife having a generally planar blade and a handle, said knife having a projection extending laterally therefrom in the plane of said blade;
a scabbard including a blade receiving section and a handle enclosing section extending longitudinally from said blade receiving section;
said scabbard defining a stop along an inner side of one edge thereof for engaging over said projection when said knife is inserted in said scabbard to prevent longitudinal with-

drawal movement of said knife with respect to said scabbard;

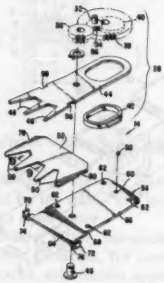
said handle enclosing section being resilient to permit movement of said knife handle toward an edge of said scabbard opposite said one edge, thereby disengaging said projection from said stop and permiting withdrawal of said knife from said scabbard.

3,958,331

GARDEN TOOL WITH MOVABLE BLADE AND DETACHABLE STATIONARY BLADE

Elmer C. Klebe, Jr., Easley, S.C., assignor to The Singer Company, New York, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,653
Int. Cl.² B26B *19/04;* **A01D** *53/10*
U.S. Cl. 30—216 **4 Claims**



1. In combination with a hand-held portable grass cutting tool having a motor journaled in a housing carrying drive means driven by said motor, a blade assembly comprising:

a. a movable blade driven by the drive means,

b. a stationary plate connected to the housing immediately underneath the movable blade and having a step down ridge terminating in a short outer layer having a forward edge, whereby the ridge defines a space between the movable blade and the outer layer,

c. a pair of outwardly extending prongs formed on opposite sides of the outer layer of the stationary plate,

d. a stationary blade detachably connected to the stationary plate within the space created between the movable blade and the outer layer,

e. a pair of recesses formed on opposite sides of the stationary blade to loosely receive the prongs therein and to hold the stationary blade in position within the space,

f. a plurality of cutting teeth formed on the movable blade,

g. a plurality of stationary teeth formed on the stationary blade to coact with the cutting teeth in shearing garden material, and

h. the stationary blade fulcrumed at the outer edge of the outer layer to partake of pivotal motion upon any garden material becoming lodged between the teeth to prevent damage to the movable blade.

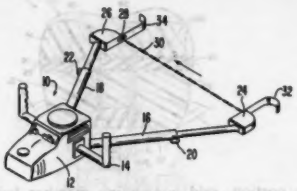
3,958,332

CABLE SAW

Elmer L. Gates, 565 Middlebury, Sunnyvale, Calif. 94087; Richard K. Goodell, 2212 Wren Way, Campbell, Calif. 95008, and Elmer Lee Gates, Jr., 1011 Narciso Court, San Jose, Calif. 95129

Filed Apr. 14, 1975, Ser. No. 567,651
Int. Cl.² B27B *13/08*
U.S. Cl. 30—380 **7 Claims**

1. An improved cable saw of the type having a flexible cable, a plurality of tubular cutting links threaded on the cable at spaced apart intervals and motor means for driving the links in a forward direction, wherein the improvement comprises nonrotatably attaching the cutting links to the cable, the cutting links having cutting teeth at their leading ends and an enlarged diameter section adjacent their trailing ends to clear the cut made by the cutting teeth, and the motor means includes a motor driven, slotted sprocket wheel



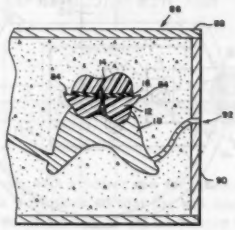
whose slotted sprockets carry the cable in the sprocket wheel slot and sequentially engage the cable immediately behind each cutting link trailing end and abut the enlarged diameter section of each cutting link to pull the cable.

3,958,333

ARTIFICIAL TEETH WITH LOCATING LUGS AND METHOD FOR USING SAME

Henry C. Heimansohn, Danville, Ind., assignor to Indiana University Foundation, Bloomington, Ind.

Continuation-in-part of Ser. No. 532,513, Dec. 13, 1974. This application Mar. 6, 1975, Ser. No. 556,168
Int. Cl.² A61C *13/00*
U.S. Cl. 32—2 **8 Claims**



1. A denture comprising a denture base and a plurality of teeth anchored in said base, said base being formed in a mold in which said teeth are embedded, each said tooth having a base portion providing a ridge lap surface, an occlusal portion providing an occlusal surface, and a resilient layer sandwiched between the secured to said base portion and occlusal portion, wherein the improvement comprises lug means for locating said base portion in said mold when said base is formed, said lug means extending outwardly from said base portion to engage said mold.

3,958,334

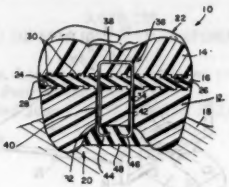
RESILIENT ARTIFICIAL DENTURE TOOTH

Henry C. Heimansohn, Danville, Ind., assignor to Indiana University Foundation, Bloomington, Ind.

Filed Dec. 13, 1974, Ser. No. 532,513
Int. Cl.² A61C *13/00*
U.S. Cl. 32—2 **8 Claims**

1. An artificial tooth comprising a rigid base portion providing a ridge lap surface, a rigid occlusal portion providing an occlusal surface, a resilient intermediate portion sandwiched between and secured to said base portion and occlusal portion, and means for connecting said occlusal portion to said base portion, said connecting means including a connecting member having one of its ends rigidly connected to said occlu-

sal portion, and its opposite end pivotally and loosely connected to said base portion to permit controlled limited movement of said occlusal portion relative to said base portion, said connecting member extending through said resilient intermediate portion, said connecting member being a U-shaped anchor wire, the base of which is rigidly secured to said occlusal portion to provide a pair of vertically extending legs and the distal ends of which are loosely pivotally secured to said base portion.



3,958,335

ANGLE SETTING MECHANISM, IN PARTICULAR FOR VISES

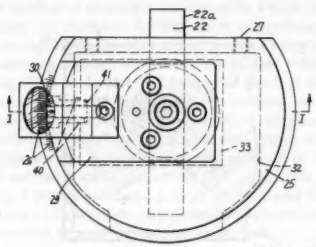
Franz Arnold, Spatzenweg 20, 8960 Kempten, Germany, and Oscar Boehm, Basagoiti 31, Algorta (Viscaya), Spain

Filed Nov. 18, 1974, Ser. No. 525,045

Claims priority, application Germany, Nov. 23, 1973, 7341746[U]

Int. Cl.² G01B 3/56

U.S. Cl. 33—75 R **11 Claims**



1. An angle setting mechanism for indicating an angle to which an angularly adjustable vise is to be adjusted, comprising:

a. pivot means, said pivot means having an adjusting slide means secured to a planar underside thereof and which is adapted to be inserted into a T-groove in a machine table, said slide means having a width to fit snugly into and engage at least one of the opposed walls of the narrowest section of said T-groove;

b. a graduated disk rotatably supported on said pivot means, said graduated disk having a scale and a straight guide face thereon, said guide face being perpendicularly arranged to said planar underside of said pivot means and adapted to abut a plane side surface on said vise;

c. an indexing plate fixedly connected to an upper surface of said pivot means and has a vernier thereon cooperating with said scale, said vernier having a zero line which is fixed exactly opposite and perpendicular to at least one side surface on said adjusting slide means which engages one of said opposed walls of said T-groove, said scale and zero line indicating the relative angle of said guide face to the longitudinal axis of said T-groove; and

d. releasable clamping means for securing said graduated disk to said pivot means;

whereby said angle setting mechanism is independent of said vise and is placed beside and abuts said plane side of said vise so that said scale and zero line will indicate the relative angle of said vise to the longitudinal axis of said T-groove.

3,958,336

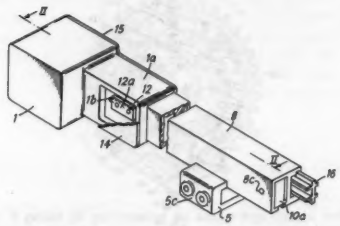
DEVICE FOR LINEAR MEASUREMENT

Charles Henry Pentland Denroche, 90 Park Road, Hampton Wick, Kingston-upon-Thames, Surrey, England

Continuation of Ser. No. 447,558, March 4, 1974, which is a continuation of Ser. No. 292,423, Sept. 26, 1972, abandoned. This application Nov. 11, 1974, Ser. No. 522,756

Int. Cl.² G06G 1/00

U.S. Cl. 33—125 A **12 Claims**



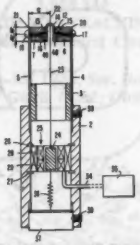
1. Apparatus for highly accurate measurement of linear movement in increments in the range of from 1000 to 2540 mm per inch, comprising in combination: a first housing having a transducer mounted in one end portion thereof, said transducer having a stator system of light sensitive cells and a rotor system to cut light off periodically to produce a succession of electrical pulses which can be counted, the number of said pulses not exceeding 5000 per revolution of said rotor system; a driver pulley mounted on the spindle of said rotor system within said first housing; a second housing adjustably positionable at one of its ends within the other end portion of said first housing, said second housing having a linear support formed along one side thereof; an idler pulley mounted within said second housing adjacent the other end of said second housing in the same plane as said driver pulley in said first housing; traveller means mounted in said second housing and reciprocally movable along said linear support in a path which has its limits between said pulleys; at least one taut, unyielding drive loop of a single strand wire extending between said pulleys and encompassing said pulleys around one-half of their respective circumferences, said loop being secured to said traveller means, said second housing being adjustably positioned within said first housing to form said taut loop and secured in this position; said driver pulley having a circumference such that the increment of measure of linear movement of said traveller means corresponds to the ratio of one-half the said circumference to the number of pulses produced by one-half revolution of said rotor system; said wire being of a non-corrosive metallic composition which has been drawn to a very small diameter throughout its length with great accuracy and which will not work-harden from repeated bendings around said pulleys; said diameter being so small and said transducer having a driving torque so low that the rotation of the rotor system and movement of said traveller means occurs without noticeable slip of said taut driving loop.

3,958,337

MEASURING SYSTEM FOR DIRECT FEELING GAUGE

Cesare Anichini, Florence, Italy, assignor to Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C., Bentivoglio, Italy

Filed Sept. 25, 1974, Ser. No. 509,216
Claims priority, application Italy, Oct. 25, 1973, 3520/73
Int. Cl.² G01B 7/12
U.S. Cl. 33—143 L 12 Claims



1. A gauge of the direct feeling type, comprising:

a frame;

first and second elongated flexible elements, rigidly supported at one end by the frame and extending therefrom flexibly parallel to each other;

first and second feelers, rigidly connected with the other end of said flexible elements, for contacting the workpiece to be measured, said feelers approaching and moving away from each other, thereby flexing said flexible elements;

two rigid members rigidly supported by said flexible elements at their said other end, said members being arranged between the flexible elements;

flexible linking means joining together said rigid members for allowing said approaching and moving away displacements of the feelers and the flexing of the flexible elements, said rigid members pivotally movable about a section of the linking means defining an axis lying midway between the ends of and within said linking means, said section being movable toward and away from said frame dependent upon the movement of said feelers; and

electrical detecting means, including an element fixed to the frame and an element linked to said section at the location of said axis and movable with the same, to detect the displacements of said section.

3,958,338

GAUGE WITH ELECTRIC POSITION TRANSDUCERS TO MEASURE THE SIZES OF MECHANICAL WORKPIECES

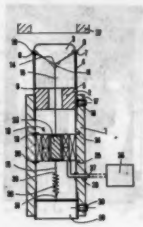
Cesare Anichini, Firenze, and Mario Possati, Bologna, both of Italy, assignors to Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C., Bentivoglio, Italy

Filed Aug. 28, 1974, Ser. No. 501,271
Claims priority, application Italy, Sept. 7, 1973, 3494/73
Int. Cl.² G01B 7/12
U.S. Cl. 33—178 E 7 Claims

5. A gauge for measuring the internal size of a bored mechanical workpiece comprising:

a frame;

a protection plug fixed to said frame; feeler-carrying-means including: two opposed, elastically deformable, elongated lamina sections, each section having one end fixed with respect to said protection plug, and extending in an axial direction of the protection plug, said sections being elastically deformable in a radial direction of the plug; and a transversal lamina section connecting two other ends of said opposed lamina sections, a point of said transversal lamina section being movable in the axial direction of the frame upon elastical deformation of said two lamina sections in the radial direction; a first and a second feeler fixed at said other ends of the two lamina sections, to be movable in the radial direction of the plug, for contacting the workpiece to be measured; and



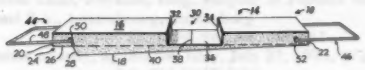
a position transducer including a wire having an end connected to said point of the transversal section, a moving element coupled to the wire, means for maintaining the wire under tension and in an axial direction with respect to said plug, and detecting means adapted to provide a signal responsive to the workpiece size depending on the axial position of said wire and moving element.

3,958,339

CUTTING GUIDE

Gerard F. Thornell, 29 Albany St., Wollaston, Mass. 02170

Filed June 23, 1975, Ser. No. 589,037
Int. Cl.² B27G 23/00; B27C 5/00
U.S. Cl. 33—185 R 10 Claims



1. A device for use with a power saw for positioning a saw blade relative to a workpiece so that the saw blade will cut halfway into a given dimension of the workpiece for making fitted joints, said device comprising an elongated body having an upper surface, a lower surface, a first end and a second end, said lower surface at said first end is cutaway to form a resting surface and an abutting surface, a first corner formed at an intersection of said resting surface and said abutting surface, a second corner formed at an intersection of said second end and said lower surface, said first corner and said second corner disposed in a common plane, and guide means at a medial portion of said body midway between said first and second corners, said guide means disposed in said common plane, whereby said guide means is disposed in a plane that intersects the midline of a given dimension of the workpiece when said resting surface is placed on the workpiece and said abutting surface is pressed against an edge of the workpiece.

3,958,340

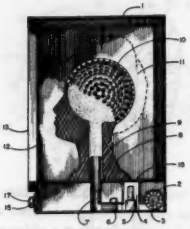
METHOD AND APPARATUS FOR DRYING WIGS

Jess Edward Meyers, 1013 Silver Lake Drive, Las Vegas, Nev. 89108

Continuation-in-part of Ser. No. 407,803, Oct. 19, 1973, abandoned. This application May 15, 1975, Ser. No. 577,894
Int. Cl.² F26B 3/34
U.S. Cl. 34—1 5 Claims

1. A method of drying a wig comprising passing at least about 10 cubic feet per minute of air through substantially all of the fibers of the wig, and simultaneously subjecting the wig to microwave radiation applied at predetermined intermittent

intervals wherein the radiation is applied for a duration of from about ½ second to about 25 seconds, separated by intervals of from about ½ second to 30 seconds during which essentially no microwave radiation is applied.



3,958,341

PROCESS FOR THE PRODUCTION OF ACTIVE ALUMINUM OXIDE IN BEAD AND POWDER FORM

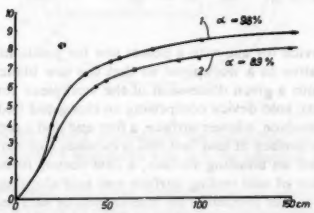
Ernst Podschus, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. Nos. 204,736, Dec. 3, 1971, abandoned, and Ser. No. 363,059, May 23, 1973, abandoned. This application Oct. 17, 1973, Ser. No. 407,096

Claims priority, application Germany, Dec. 5, 1970, 2059946; June 8, 1972, 2227804

Int. Cl.² F26B 7/00

U.S. Cl. 34—12 **4 Claims**



1. A process for producing highly active aluminum oxide having a heavily distorted crystalline structure of χ (chi)-Al_2O_3, a specific surface area of 260 to 400 m²/g according to BET, a residual water content of 2 to 10% and a water absorption capacity at 50% relative humidity of more than 15%, said process comprising establishing a vortex of hot gas having an entry end, an outlet end and a central area in which there is a flow of gas toward the entry end of the vortex, said central area being surrounded by an external area in which there is a circular flow of hot gas around said area and toward the outlet end of the vortex, said gas entering said vortex at a temperature of from 500° to 1200°C. at a rate of inflow of 30 to 150 m/sec., introducing aluminum oxide trihydrate into said central area and thereby suspending said aluminum trihydrate in the hot gas and producing a suspension having a temperature of 350° to 800°C., removing the resulting suspension from the vortex at a rate that the residence time thereof in the vortex is from 0.1 to 2 seconds and recovering resulting highly active aluminum oxide from said suspension.

3,958,342

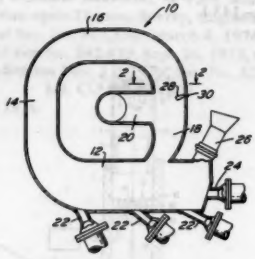
NON-CLOGGING CENTRIFUGAL DRYING MILL

Nicholas N. Stephanoff, Haverford, Pa., assignor to Fluid Energy Processing & Equipment Co., Hatfield, Pa.

Filed Mar. 20, 1975, Ser. No. 560,252

Int. Cl.² F26B 17/00

U.S. Cl. 34—57 E **5 Claims**



1. A centrifugal drying mill for wet particles comprising a generally arcuate housing including, in progression, an inlet chamber, an upstack, a classification section, and a downstack, said downstack leading into said inlet chamber, an exhaust duct leading from the inner periphery of said housing between said classification section and said downstack, a feed inlet connected to said inlet section to deliver wet particulate material thereto, a plurality of gaseous fluid nozzles constructed and arranged to propel hot gaseous fluid from a source thereof into said inlet chamber in such a manner as to entrain the particulate material, apply drying heat thereto, and propel the particles thereof in a centrifugal path through said housing, and means between said classification chamber and said downstack to prevent centrifugal separation of lighter from heavier particles and to concentrate dry particles of varying weights in the inner peripheral portion of said centrifugal path adjacent said exhaust duct to permit passage of the concentrated dry particles through said exhaust duct.

3,958,343

DEVICE FOR CONTINUOUSLY TREATING A WEB BY A STEAM ATMOSPHERE

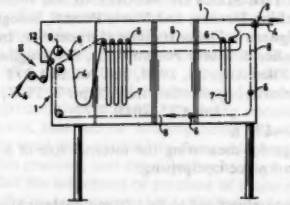
Jacobus Gerardus Vertegaal, Boxmeer, Netherlands, assignor to Stork Brabant B.V., Boxmeer, Netherlands

Filed Aug. 28, 1974, Ser. No. 501,469

Claims priority, application Netherlands, Aug. 28, 1973, 7311848

Int. Cl.² F26B 13/08

U.S. Cl. 34—157 **6 Claims**



3. A device for continuously treating a web by a steam atmosphere, comprising a housing with an inlet and an outlet for this web and within this housing a provision for forming loops in the supplied web, and some guide rail along which the web to be treated is moved in downwardly extending loops, some driven rollers being disposed for feeding the web through a slit-shaped passage into the housing, one of said driven rollers lying within the housing and the other one out-

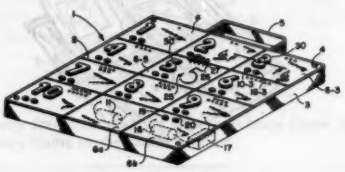
side the housing at both sides of said slit-shaped passage, a suction device and some guide plates (23,24) being arranged outside the housing near said passage for maintaining a cooling air stream along the web during its travel from the outer feed roller (11) towards the slit-shaped passage, and sealing means in said slit-shaped passage sealing off the housing from the suction device to preclude the steam atmosphere within said housing from escaping from said housing.

3,958,344

TEACHING AID FOR TEACHING NUMBERS

Carole M. Lesiak, 7823 Oakhurst Circle, Brecksville, Ohio 44141

Filed Nov. 15, 1974, Ser. No. 524,077
Int. Cl.² G09B *19/02*; G09F *13/04*
U.S. Cl. 35—31 R **9 Claims**



1. An educational device for teaching numbers by stimulation of plural senses of the user, comprising:

an integral package including a container-like support and a board coupled to said support to define a closed hollow interior portion, said board having an accessible, generally planar surface, and said accessible surface being divided to a plurality of easily distinguishable discrete spaces;

a plurality of different numbers on said board, each of said numbers being located on said surface in a different respective discrete space to facilitate distinguishing between numbers, each of said numbers being raised relative to the plane of said surface, and said numbers also being positioned in a pattern to facilitate counting said numbers in a logical order; and

a self-contained electric circuit in said package, including power supply means for supplying electric power, switch means for closing at least a portion of said electric circuit, said switch means being mounted on said board for convenient access, and electrically responsive sensorially perceivable indicator means coupled to said power supply means and to said switch means for indicating closure of said switch means, said indicator means comprising a plurality of lamps, each being positioned relative to a respective one of said numbers for illuminating the same, said switch means comprising a plurality of switches, each being positioned proximate a respective number in the discrete space thereof and coupled with a respective lamp positioned for illuminating such number for selective energization thereof, said power supply means being entirely within said hollow interior portion of said integral package;

said indicator means further comprising a buzzer, and said switch means further comprising a plurality of further switches, each being located proximate a respective one of said numbers for energization of said buzzer;

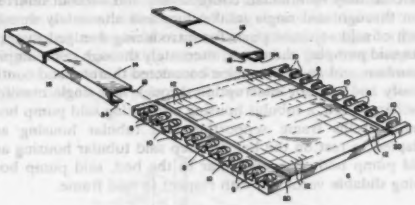
whereby the educational device forms a self-contained integral structure with the respective numbers on said board being stimulative of the sense of sight and said indicator means when energized also effecting stimulation of at least one of the senses of sight, touch and hearing.

3,958,345

LANGUAGE INSTRUCTION DEVICE

Amelia Contreras, 300 W. 55th St., New York, N.Y. 10019

Filed Mar. 17, 1975, Ser. No. 559,222
Int. Cl.² G09B *1/06*
U.S. Cl. 35—35 H **1 Claim**



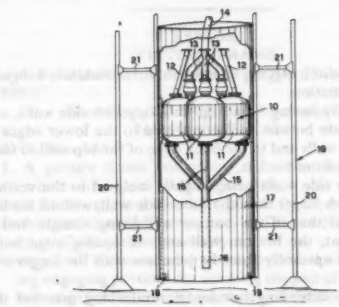
1. A language instruction type device comprising a board having marginal, open ended niches formed in its upper surface, play pieces contained in said niches, said pieces having language indicia inscribed thereon, said board having a playing surface formed of a plurality of squares, a slidable cover being provided for said niches, said cover having a portion bearing against the under surface of said board and a second portion covering said niches in the upper surface thereof, a groove formed in said upper surface and a tongue secured to said second portion of the cover adapted to be received in said groove, said groove being provided beyond the playing surface of the board whereby said surface is completely exposed when said cover is secured in said groove.

3,958,346

MULTIPLE PUMPING CHAMBER DREDGING APPARATUS

Giovanni Faldi, Florence, Italy, assignor to Pneuma International S.A., Luxembourg, Luxemburg

Filed July 23, 1974, Ser. No. 490,962
Claims priority, application Italy, July 27, 1973, 27228/73
Int. Cl.² E02F *3/88*
U.S. Cl. 37—59 **3 Claims**



1. Apparatus for sample removal from underwater beds and/or dredging of loose beds in which adjacent soil would be likely to slide down into the dredged area, said apparatus comprising a submersible pump body including at least two pumping chambers, air intake pipe means connected to each of said pumping chambers, said air intake pipe means being connected to a comprssed air source through distributor means for alternately and periodically supplying compressed air to said pumping chambers to effect pumping therein, a separate pipe connected to each of said pumping chambers for introducing dredged material mixed with water therein under the waterhead acting on the submersible pump body and a

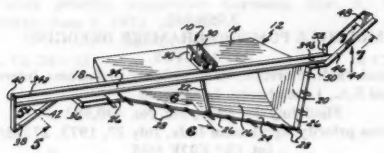
pipe for the outflow of dredged material connected to each of said pumping chambers, each of said pipes for the outflow of dredged material converging and being connected to a single manifold discharge pipe, each of said separate pipes for introducing dredged material into said pumping chambers also being connected to and diverging from a single intake duct whereby under the action of compressed air intake of dredged material may be effected continuously and without interruption through said single intake duct and alternately through each of said separate pipes for introducing dredged material into said pumping chambers, alternately through said pumping chambers and an outflow pipe connected thereto, and continuously and without interruption through said single manifold discharge pipe, a tubular housing containing said pump body and a trellis frame supporting said tubular housing and adapted to rest on the bed to keep said tubular housing and said pump body perpendicular to the bed, said pump body being slidable vertically with respect to said frame.

3,958,347

DRAIN DITCH DIGGING ATTACHMENT FOR A BACK-HOE

Leroy Marvin Heitman, 3083 W. Ball Road, Anaheim, Calif. 92804

Filed July 11, 1974, Ser. No. 487,546
Int. Cl.² E02F *3/40*
U.S. Cl. 37—103 **3 Claims**



1. A drain ditch digging attachment for a back-hoe comprising in combination,

a main body having a flat top wall, opposite side walls, and an arcuate bottom wall connected to the lower edges of the side walls and to the back edge of the top wall to form an open-front bucket,

one of the side walls being slightly inclined to the vertical and much larger than the other side wall, with its leading edge and that of the bottom wall being straight and in alignment, the bottom wall and its leading edge being inclined upwardly from its juncture with the larger side wall,

a laterally extending horizontal reinforcing member disposed across and integrally connected to the top of the bucket and which extends parallel to the leading edges of the bucket and outwardly beyond the side walls such that it would be above the ditch formed by the bucket,

a cutting and smoothing member disposed adjacent the larger side wall which is connected to one end of the reinforcing member and extends outwardly and upwardly in alignment with the leading edge of the side wall,

the opposite end of the reinforcing member extending outwardly beyond the opposite side wall for a distance approximately half the width of the bucket and having a ground shaping member depending therefrom,

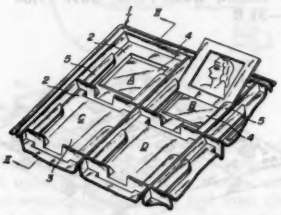
means connected to the reinforcing member and to the top wall for providing a connection to a back-hoe.

3,958,348

SLIDE FILING PLATE

Yoshichika Sakamoto, Ohmiya, Japan, assignor to Slidex Corporation, Tokyo, Japan

Filed Nov. 14, 1974, Ser. No. 523,799
Claims priority, application Japan, Nov. 28, 1973, 48-133668
Int. Cl.² G09F *13/10*
U.S. Cl. 40—106.1 **6 Claims**



1. A slide filing plate comprising a substantially planar body, a plurality of slide-receiving pockets formed in the body and receiving one slide in each pocket, said pockets having bottom walls disposed in a common plane and comprising slide-supporting portions, so as to dispose films of slides placed in the pockets in a common plane parallel to the plane of the bottoms of the pockets, and a plurality of membranes passing at least a part of incident light therethrough to a degree of not less than translucence, each of said membranes being formed as one piece with the bottom and bottom wall of a corresponding one of the pockets parallel to said common plane but with a spacing from the plane of the bottom wall, said membrane being formed as a recessed portion of said slide-supporting portion the spacing between the membrane and the film of the slide placed in the pocket being greater than the spacing between the slide-supporting portion of the pocket bottom wall and the last mentioned slide film to prevent the image of particles on the membrane from being projected on a screen.

3,958,349

TELESCOPING SUPPORT FOR ELEVATED SIGNBOARD

James G. Nidelkoff, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 26, 1975, Ser. No. 590,721
Int. Cl.² G09F *7/00*
U.S. Cl. 40—125 H **4 Claims**

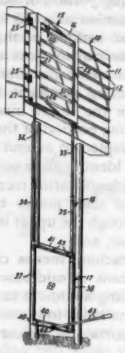
1. A frame for changeable photographic transparencies of an enlarged size on an elevated signboard comprising in combination:

a primary rectangular frame structure having fastening means thereon for supporting said primary frame on an illuminated sign,

a secondary tubular frame having clamp means for supporting therein a photographic transparency,

telescoping rails supporting said secondary frame from the upper portion of said primary frame and guiding said secondary frame within the primary frame structure, and

fastening means on said secondary frame adjacent the lower edge thereof cooperating with fastening means in the



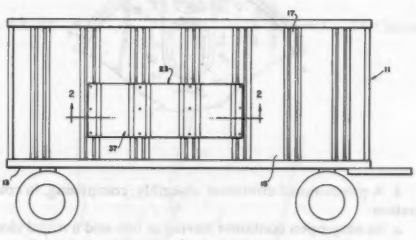
primary frame for locking said secondary frame in the primary frame in the raised position.

3,958,350

SIGN BOARD FOR TRUCK TRAILERS, SEMI-TRAILERS AND SHIPPING CONTAINERS

Joseph Garson, Franklin, Mich., assignor to Kux Manufacturing Company, Detroit, Mich.

Filed July 25, 1975, Ser. No. 599,184
Int. Cl.² G09F 7/00
U.S. Cl. 40—129 C **8 Claims**



1. In combination with a truck trailer, semi-trailer or shipping container having flat side plates and a series of spaced upright posts, whose side edges project outwardly of said plates, a sign board having an elongated flat body with appropriate legend printed thereon, and formed to include a series of longitudinally spaced parallel projections corresponding to the spacing of said posts, said body bearing against said side plates and said projections bearing against the outer surfaces of said posts; and

fastening means interconnecting said projections and posts.

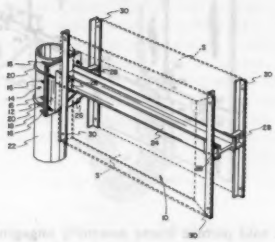
3,958,351

MODULAR SIGN SUPPORT ASSEMBLY

Mike Summey, 514 Rhododendron Ave., Black Mountain, N.C. 28711

Filed Nov. 25, 1974, Ser. No. 526,791
Int. Cl.³ G09F 7/18
U.S. Cl. 40—145 R **4 Claims**

1. A modular sign support assembly for supporting sign means for an upright generally cylindrical shaped pole, said modular sign supporting assembly comprising: a base support unit including a planar plate structure; fitting means secured to the back of said base support unit for stablizing said base support unit relative to said pole, said fitting means including a generally arcuate shaped back portion having a plurality of vertically spaced ribs, each rib being fixed to the back of said base support unit and having an arcuate shaped back edge formed thereon which normally engages the circumference of said pole when said base support unit is disposed and held adjacent thereto, whereby said fitting means enables said base support unit to be held in a stable relationship adjacent said upright pole; connecting means secured to said base support unit and extending therefrom for securely stationing said base support unit to said pole; cantilever beam means fixed to said



base support unit and extending therefrom; brace means extending between said planar plate support and said cantilever beam means for supporting said cantilever beam means relatively to said planar plate structure; and mounting frame means fixed to said cantilever beam means for receiving sign means and supporting the same outwardly of said upright pole, said mounting frame means including at least two vertical support members operatively supported by said cantilever beam means on each side thereof and extending in generally parallel relationship with the axis of said pole, respective vertical members on each of said cantilever beam means being laterally spaced and adapted to receive and support at least one sign.

3,958,352

PICTURE FRAME

Joseph P. Eubank, Jr., 44 Laurel View Ave., Inverness, Calif. 94937

Filed Mar. 27, 1975, Ser. No. 562,492
Int. Cl.² G09F 1/12
U.S. Cl. 40—155 **10 Claims**

1. A picture frame comprising a frame means for each corner of a rectangular picture assembly,

each frame means including a pair of frame members,

each frame member having one end formed to engage an edge of the picture assembly,

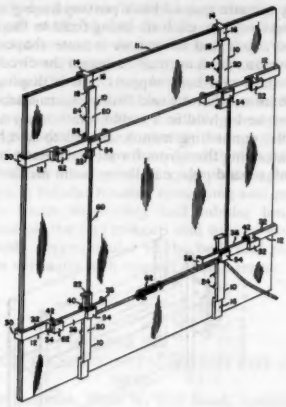
each pair of frame members being provided with cooperating engaging portions for securing the pair of frame members together in crossed relation by a friction fit at a first location and second cooperating engaging portions for securing the pair of frame members together in crossed relation by a friction fit at a location spaced from said first location,

one of said pair of frame members of each frame means providing a cleat arranged to be positioned on the back side of the picture assembly in spaced relation therefrom,

and cord means extending between each of said frame means and engaging each of said cleat means on said one frame member thereof,

said cord means being secured in a tensioned condition to urge said frame means at each corner of the picture assembly together and toward a central location of the picture assembly,

to urge said frame members toward contact with the back side of the picture assembly and



to urge said picture frame assembly engaging end of each frame member into securing engagement with an associated edge of the picture assembly.

3,958,353

TWO PIECE ANIMAL IDENTIFICATION TAG ASSEMBLY

Norman J. Hayes, Standing Star Simmental Ranch, P.O. Box 618, North of Cody, Park County, Cody, Wyo. 82414

Filed Apr. 29, 1974, Ser. No. 465,286

Int. Cl.² G09F *3/00*

U.S. Cl. 40—301 **16 Claims**

1. An ear tag assembly for an animal of the bovine species of which the ear extends generally laterally outwardly of the animal head with a frontal downwardly extending lobe portion, a rear lobe portion, and an upper interconnecting portion having upper outer and lower inner surfaces between the lobe portions, comprising:

an identification member adapted to be fixedly mounted on the upper outer surface of the upper interconnecting portion of the animal ear next adjacent the animal head, said identification member comprising:

a base portion having a downwardly facing lower abutment surface adapted to abuttingly engage the upper outer surface of the upper interconnecting portion of the ear,

an identification portion extending upwardly laterally outwardly from said base portion in a plane generally transverse to said downwardly facing lower abutment surface so as to be located in a vertical upright position when said downwardly facing lower abutment surface abuttingly engages the upper outer surface of the upper interconnecting portion of the ear, and

first tag attaching means on said base portion for holding said identification member on the ear with said downwardly facing lower abutment surface in abutting engagement with the upper outer surface of the upper interconnecting portion of the ear; and

an attachment member adapted to be fixedly mounted on the lower inner surface of the upper interconnecting portion of the animal ear next adjacent the animal head, said attachment member comprising:

an upwardly facing abutment surface adapted to abuttingly engage the lower inner surface of the upper interconnecting portion of the ear,

shaft means adapted to extend generally parallel to the plane of said identification portion for fixedly interconnecting said identification member and said attachment member, said shaft means being adapted to extend vertically through the upper interconnecting portion of the animal ear, and

second tag attaching means cooperable with said tag attaching means on said base portion for holding said upwardly facing abutment surface in abutting engagement with the inner lower surface of the upper interconnecting portion of the ear.

3,958,354

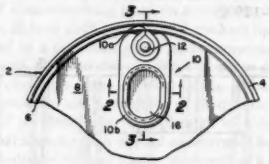
PROMOTIONAL TOKEN FOR A PULL TAB RING OPENER

Robert J. Hough, 437 Breezewood Drive, Ballwin, Mo. 63011, and Ray Ponder, 2519 Sweetwater Trail, Maitland, Fla. 32751

Filed Jan. 9, 1973, Ser. No. 322,162

Int. Cl.² G09F *3/00*

U.S. Cl. 40—307 **15 Claims**



1. A promotional container assembly, comprising, in combination:

a. an easy-open container having at one end a metal closure member containing a removable end panel portion;

b. means including a pull tab ring opener for removing said end panel portion; and

c. a promotional token member including

1. a mounting portion having, in plan view, an outer peripheral configuration that corresponds with the inner peripheral configuration of the opening contained in the finger ring portion of the pull tab opener; and

2. means operable when said mounting portion is contained within said ring opening for connecting said token member with said ring opening.

3,958,355

COMBINATION BAIT HOLDER AND FISH HOOKING MEANS

Harry L. Findon, 501 Blue Heron Drive, Apt. 110A, Hallandale, Fla. 33009

Filed Apr. 7, 1975, Ser. No. 565,410

Int. Cl.² A01K *83/06*

U.S. Cl. 43—44.2 **5 Claims**

1. A fish bait holding device comprising;

an arcuate body having a generally convex upper side and a concave lower side,

a clamping means connected to the forward portion of said body, said clamping means includes a hill-and-dale portion and an adjacent portion of said body, said hill-and-dale portion biased toward the concave side of said adjacent portion of said body, said hill-and-dale portion projects rearwardly for placement in the mouth of the bait fish to hold the head of the bait fish against the concave side of said body and to prevent the fish bait from moving forward off the device,

a fishing line connecting means positioned between said body and said adjacent portion of said body,

a hook means connected to the rearward portion of said body, said hook means including two hooks moveable relative to one another for impaling the sides of the fish bait between the first and second hooks to prevent the fish bait from moving rearwardly off the device, and

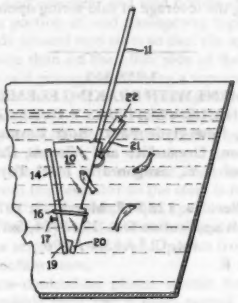
said fish hooks include eyes pivotally connected to said body, said hooks have barbs positioned below the concave side of said body and moveable toward and away from one another for engagement with opposite sides of the bait fish.

3,958,356

ENCLOSED MINNOW DIPPER WITH AUTOMATIC ACCESS DOOR

Andrew J. Clingan, 2402 Phillips Lane, Texarkana, Tex. 75501

Filed Aug. 4, 1975, Ser. No. 601,752
Int. Cl.² A01K 97/04
U.S. Cl. 43—4 **11 Claims**



1. A minnow dipper comprising;

a normally enclosed cup in the form of a hollow inverted triangular prism;

the rectangular rear wall of said cup having an intermediate access opening extending between the sides of the cup and a first array of spaced downwardly extending teeth along the lower margin;

the rectangular front panel being attached to and substantially covering the forward face of the cup and having a second array of spaced downwardly directed teeth along the lower margin in spatially adjacent registration with said first array of teeth;

a door disposed to normally close said access opening, hinge means suspending said door from the superjacent body portion and buoyant means fixed to said door;

said buoyant means being effective to open said door concurrently with the immersion of said cup in water when said cup is disposed in a predetermined angular relationship with a vertical plane; and

a manipulative handle extending outwardly from the upper margin of said rear wall.

3,958,357

FISH BAIT PACKAGE

Robert Frank, Rte. 3, Box 182, Shawnee Mission, Kans. 66209

Filed Feb. 24, 1975, Ser. No. 552,242
Int. Cl.² A01K 85/00
U.S. Cl. 43—42.06 **2 Claims**

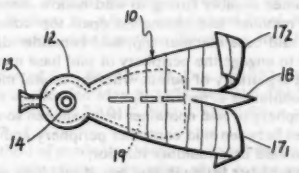
1. A fish bait package comprising a hollow body member formed of a foraminous material and containing a fish bait of a water soluble dough type including odor producing ingredients, said package being adapted to be mounted on a fishhook, whereby when said fishhook and package are immersed in water, water will enter and circulate in said body member through the foramina thereof to dissolve said bait material and release the odor producing ingredients thereof, said body member being formed of a material easily penetrated by the point of a fishhook, whereby said package may be mounted on said hook by inserting the point of said hook therethrough, said body member being of slender, elongated form and being transversely flexible, whereby it may be configurated to extend along and enclose a substantial portion of the length of the wire of which said fishhook is formed, thereby camouflaging said fishhook, said body member including a portion formed of strongly elastic material through which the point of said fishhook may be inserted inwardly until said elastic portion engages a portion of the hook wire remote from said point, elastic contraction of said elastic portion then gripping said wire frictionally to secure said package on said fishhook.

3,958,358

FISHING LURE

Herman P. Firmin, 11325 Granberry St., Baton Rouge, La. 70811

Filed Oct. 1, 1974, Ser. No. 510,983
Int. Cl.² A01K 85/00
U.S. Cl. 43—42.51 **9 Claims**



1. As an article of manufacture, an aquatic fishing lure for use with a rod, line and hook, by virtue of which hook the lure can be attached via the line to the rod, characterized as com-

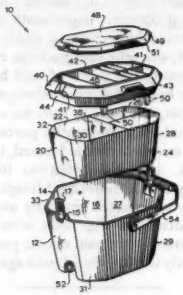
prising an elongate body and paired wings constituted as a unitary member formed of soft plastic, each of said paired wings being from about 2 to about 4 times wider than the average width of the elongate body and the diameter of the arc circumscribed by the tips of the paired wings on rotation being equal to or greater than the length of the elongate body, the paired wings being carried on the rearward end of the elongate body as bifurcated, flattened, twisted, balanced rearward projections which flare diametrically outwardly, one on each side of, and each being arced about, said elongate body to form, in essence, a single, continuous helical rib, the lure resembling an insect having, besides the elongate body and facsimile of a pair of insect wings, a forward knob on the elongate body which resembles an insect head capsule, a lateral opening through the forward knob which resembles eyes and which serves as a convenient point of attachment for the hook, a forward projection on the forward knob which resembles insect mouth parts, body appendages which resemble legs, antennae or other specialized insect parts, and due to such structure the lure can be actuated and rotated on casting and passage through air, and torque applied to the attached line such that, on striking water, a counter rotation is applied on the lure so that it thrashes and paddles the water to create life-like movements.

3,958,359

SPORTSMAN'S COMBINATION RECEPTACLE AND ICE CHEST

Merlin L. Doughty, 2865 Malibu Court, Titusville, Fla. 32780

Filed Mar. 12, 1975, Ser. No. 557,486
Int. Cl.² A01K *97/06*
U.S. Cl. 43—55 **10 Claims**



1. A sportsman's combination receptacle and ice chest comprising:

a portable base member having a hollow interior defined by side and bottom walls, the top of said base member opposite said bottom wall being open so as to allow access to said interior thereof;

a container slidably fitting in said hollow interior of said base member and having an open top communicating with said base member top, said container dimensioned so as to engage the periphery of said base member interior at a plurality of points, whereby lateral movement of said container is restricted;

the periphery of said container being shaped so as to define spaces between said container periphery and the periphery of said base member interior;

a cover member fitting in said top of said base member and covering said container top, said cover member having a hollow interior and an open top axial with the open top of said base member; and

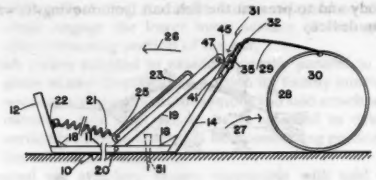
a lid member fitting into said open top of said cover member.

3,958,360

SNARE TYPE ANIMAL TRAP

Lawrence Edward King, General Delivery, Clarkleigh, Manitoba, Canada

Filed June 30, 1975, Ser. No. 591,291
Claims priority, application Canada, July 26, 1974, 205729
Int. Cl.² A01M *23/34*
U.S. Cl. 43—87 **6 Claims**



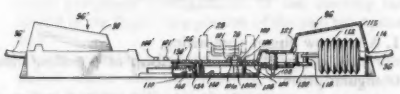
1. A snare type animal trap including a snare wire having a sliding loop portion and an attaching portion extending from said sliding loop portion; comprising in combination a supporting frame, a stationary member extending from said supporting frame, a movable member pivoted by one end thereof to said supporting frame and extending therefrom in the same plane as said stationary member, a detachable trigger assembly operatively connecting the upper end of said stationary member and said movable member, and spring means normally urging the upper end of said movable member away from said stationary member, the attaching portion of the associated snare wire being secured to said upper end of said movable member and operatively engaging said trigger assembly, said spring means comprising a tension spring extending between said movable member and said supporting frame, and means to attach said spring by one end thereof to said movable member, said last mentioned means including a rod secured to said movable member in substantially spaced and parallel relationship therewith and a loop on said one end of said spring engaging around said rod and being slidable therealong thereby varying the leverage of said spring upon said movable member.

3,958,361

TRACK SEGMENT WITH BRAKING ELEMENTS WHICH RETAIN VEHICLE VERTICALLY DURING BRAKING

Julius Cooper, New Hyde Park; Burt Ensmann, Flushing; Edwin Nielsen, Oceanside, and Vincent Carella, Queens Village, all of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Division of Ser. No. 126,818, March 22, 1971, Pat. No. 3,860,237. This application Oct. 17, 1974, Ser. No. 515,734
Int. Cl.² A63H *18/00*
U.S. Cl. 46—1 K **6 Claims**



1. A toy vehicle track segment comprising a vehicle racing surface and means on said segment for co-acting with a surface on a vehicle to brake the vehicle while retaining it vertically, said means including first and second elongated braking elements projecting upwardly from said racing surface, said first braking element having a vehicle contacting surface which is inclined at an acute angle relative to the vehicle racing surface to form therewith a recess to receive a complementary-shaped vehicle-mounted guide to direct toy vehicles

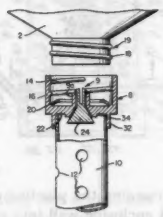
traversing the vehicle racing surface while maintaining the toy vehicle in operative contact with the vehicle racing surface; said second braking element having a vehicle-contacting surface that is inclined at an acute angle to the vehicle racing surface, said contacting surfaces of said first and second braking elements being located in spaced opposed relationship to frictionally engage a vehicle-mounted guide therebetween, said second braking element being movably mounted to the track segment for braking movement towards and away from the first braking element to influence the speed of a toy vehicle whose guide passes between the first and second braking elements.

3,958,362

FLUID DISPENSING VALVE DEVICE FOR BUBBLE TOY

Milton Kessler, 6690 Harrington Ave., Youngstown, Ohio 44512

Filed Sept. 18, 1975, Ser. No. 614,762
Int. Cl.² A63H *33/28*
U.S. Cl. 46—7 **8 Claims**



1. a. An improved bubble-making toy having a bubble-fluid reservoir, a multiple-ported hollow stem and a restricted passage device between the two, wherein the improvement comprises a construction for said passage device comprising

b. a plastic valve unit between said reservoir and said hollow stem, said unit having an aperture providing a passageway between said reservoir and said hollow stem,

c. at least a portion of said passageway tapering outwardly on the side toward said stem so that the aperture is larger on that side than on the other side of the plastic unit,

d. a plug in said passageway having a tapered portion fitting loosely into the taper of said passageway,

e. and a plurality of small spaced-apart separate nodes providing a small separation between said tapered portions of the plug and the wall of said aperture, with passages for the fluid between said nodes so that the fluid stream from the reservoir to the stem is broken up into a plurality of thin streams, the apertures thus provided being sufficiently small so that the fluid drips rather than flows at a series of points as it passes from the reservoir into the hollow stem.

7. a. A flow-controlling plastic nozzle for connecting a reservoir of bubble fluid and a multi-ported hollow bubble-making stem comprising

b. a plastic cap unit having a top wall and a cylindrical side wall,

c. means on the cylindrical side wall for connecting said cap to a fluid reservoir,

d. means on the outer side of the top wall for connecting the cap to a hollow bubble-forming cylinder,

e. said top wall having an aperture tapering outwardly on the side toward said bubble-forming cylinder so that the aperture is larger on that side than on the other side of the cap,

f. a plug in said aperture having a tapered portion fitting loosely into the taper of said aperture,

g. and a plurality of small spaced-apart separate nodes providing a small separation between said tapered portions of the plug and the wall of said aperture with passages for the fluid between said nodes so that the fluid stream from the reservoir to the cylinder is broken up into a plurality of thin streams, the apertures thus provided being sufficiently small so that the fluid drips rather than flows at a series of points, as it passes from the reservoir into the hollow cylinder.

3,958,363

DOLL AND WHEELED VEHICLE

Leigh D. Copeland, Chicago, and Howard J. Morrison, Deerfield, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 27, 1975, Ser. No. 544,285
Int. Cl.² A63H *11/10*
U.S. Cl. 46—106 **19 Claims**

1. For use with a separate figure toy or the like, a wheeled vehicle, comprising:

a frame including support means for receiving and freely supporting a figure toy;

ground engaging wheel means for rollingly supporting the frame for movement over a suitable surface;

axle means journalled on said frame and fixedly connected to said wheel means for rotation therewith, said axle means including plural axially spaced out-of-phase crank means; and

connecting means secured to each of said crank means and engageable with the figure toy when positioned on said support means to transmit motion from said axially spaced crank means to side-to-side movement of the figure toy in a life-like manner relative to the support means on the frame, in response to rotation of said axle means.

3,958,364

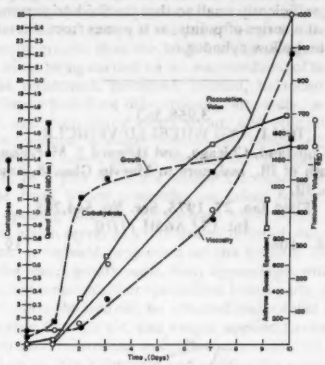
PRODUCTION OF ALGAL BIO-POLYMERS

Paula Schenck, Boston; Patricia L. Foster, Cambridge; William W. Walker, Jr., Allston, and Samuel Fogel, Newton, all of Mass., assignors to American Bioculture, Inc., Plumsteadville, Pa.

Continuation of Ser. No. 421,527, Dec. 4, 1973, abandoned. This application May 5, 1975, Ser. No. 574,744
Int. Cl.² A01G *7/00*; C02C *1/00*
U.S. Cl. 47—1.4 **14 Claims**

1. A method of producing biopolymers exhibiting flocculating activity comprising; cultivating algae in the presence of light and carbon dioxide in a nutrient medium suitable for expodential growth to a predetermined population density, thereafter restricting the available nitrogen and continuing to cultivate the algae while maintaining a supply of available phosphorus and other plant nutrients in the culture medium as

required so that the nitrogen content of the cells drops to below about 5%, and after the cellular nitrogen is below 5%



by weight, withdrawing active flocculating agent from the culture medium.

3,958,365

HORTICULTURAL AID

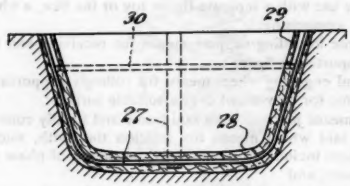
Athol Thomas Proctor, 111-113 Beleura Hill Road, Mornington, Victoria, Australia

Filed Sept. 19, 1974, Ser. No. 507,416

Claims priority, application Australia, Feb. 22, 1974, 6692/74; Apr. 8, 1974, 7201/74; May 21, 1974, 7625/74

Int. Cl.² A01G *9/02*

U.S. Cl. 47—34 R **5 Claims**



1. A horticultural aid comprising a plant basket of fibrous material, said basket being formed from two superposed mats of loosely felted fibrous material consisting principally of coconut fibre to which a waterproof adhesive bonding substance has been applied prior to the mats being compressed and compacted by a die and mould to form and shape the plant backet, reinforcement members positioned between said mats and extending across said mats, and a metal reinforcement ring operatively secured to said metal reinforcement members, said metal reinforcement members and said reinforcement ring being imbedded within said mats.

3,958,366

FLOWER POT

Robert E. Meyers, 182 Kirby Ave., Lackawanna, N.Y. 14218

Filed Sept. 3, 1974, Ser. No. 502,966

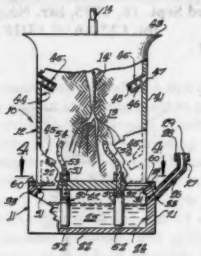
Int. Cl.² A01G *27/00*

U.S. Cl. 47—38.1 **5 Claims**

1. In apparatus for accommodating plants, the combination comprising:

a unitary reservoir container comprising an enclosing wall, a seat and a fill tube, said enclosing wall having a substantially cylindrical configuration open at one end to form a mouth and having a unitary floor at the other end to define a fluid compartment, said seat being a projection extending inwardly from said enclosing wall to form a ledge in said reservoir container and said fill tube projecting outwardly from said enclosing wall so as to communicate with said fluid compartment by a passage formed in said fill tube whereby liquid may flow through said passage to fill said fluid compartment;

a planting container comprising an enclosing wall, a plurality of hollow aerator tubes and a plurality of hollow wick tubes combined in a unitary assembly wherein said enclosing wall has a substantially cylindrical configuration and has a floor at one end to define a planting compartment which rests on said ledge when said planting and reservoir containers are joined, said hollow aeration tubes being disposed at spaced apart locations in the enclosing wall of said planting container and extending from the



atmosphere surrounding the planting container through and beyond said enclosing wall into said planting compartment whereby said surrounding atmosphere can readily communicate with soil material placed in said planting compartment so as to achieve widely dispersed internal aeration thereof, said hollow wick tubes being symetrically formed in said planting container floor with inner ends projecting into said planting compartment and outer ends projecting beyond said planting container floor;

a wick disposed in each of said wick tubes and extending beyond the inner and outer ends thereof, and

holding means for detachably joining said planting container to said reservoir container with said wick tubes projecting into said fluid compartment whereby fluid therein can be transported into said planting compartment by said wicks.

3,958,367

OVERHEAD GARAGE DOOR SPRING SAFETY DEVICE

William Fairman, 8004 Outlook Drive, Prairie Village, Kans. 66208

Filed Dec. 26, 1974, Ser. No. 536,453

Int. Cl.² E05D *15/22*

U.S. Cl. 49—197 **2 Claims**

1. In a garage door structure having a door opening and a door movable between a closed position and an open position and means exerting force to maintain the door in open or closed position comprising:

a. guide tracks arranged adjacent sides of a door opening, said guide tracks each having a vertical section and a horizontal section connected to ane extending from said vertical section;

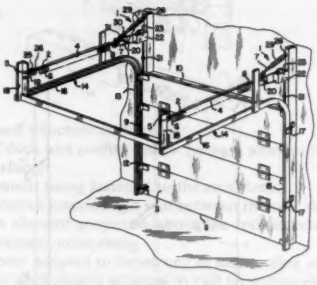
b. a door for closing said door opening, said door having rollers which are guided in the track sections for movement of the door between a closed vertical position and an open horizontal position;

c. a pair of elongate coiled springs each positioned generally horizontally and above a respective horizontal section of the guide tracks, said coiled springs each having open ends with one of said ends fixed relative to the respective

guide track and the other ends connected through cables and pulleys to lower portions of the door whereby said coiled springs are stretched in variable degree by being elongated and acting as counterbalances as the door is moved to closed position;

d. an elongated flexible member of wire rope extending longitudinally through each coiled spring and having first and second end portions extending from said one and other ends respectively of said coiled springs, said flexible members being of a length greater than the extended length of the coiled springs in door operating positions;

e. means fixing said first end portions of the elongated flexible members to a respective guide track adjacent to and beyond said fixed one end of the respective coiled spring;



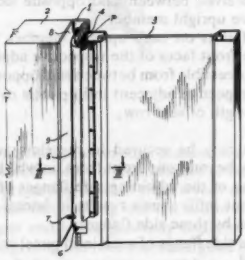
f. means connecting said second end portions of said elongated flexible members relative to a door structure adjacent to and beyond said other end of the respective coiled spring when said coiled springs are elongated in door closed position, said connecting means each including an extensible resilient member applying tension on the respective elongated flexible member, said coiled springs being sleeved on the respective elongated flexible members whereby said elongate flexible members are each adapted to support the respective coiled spring when same is in contracted position and in the event of breakage of a coiled spring the parts thereof are retained on the respective elongate flexible member.

3,958,368

FLUID PRESSURE POWERED ACTUATOR

Patrick Mannix Branigan, Dublin, Ireland, assignor to Institute For Industrial Research and Standards, Dublin, Ireland

Filed Sept. 25, 1974, Ser. No. 508,952
Claims priority, application Ireland, Oct. 4, 1973, 1774/73
Int. Cl.[2] 92 *34;* E05F *15/04*
U.S. Cl. 49—324 **8 Claims**



1. In combination, a first member, a second member, a hinge connecting the first member to the second member and defining a hinge pivot axis for the members, and a fluid pressure powered actuator for imparting angular movement to the first member relative to the second member in one sense about said axis, the actuator comprising:

an elongated inflatable conduit of substantially constant surface area, the conduit having its longitudinal axis substantially parallel to the hinge pivot axis and being disposed in that angle between the two members which is reduced on the first member moving relative to the to the second member about said axis in said one sense;

a first connecting means, connecting the conduit to the first member;

a second connecting means, connecting the conduit to the second member, the second connecting means being spaced apart from the first connecting means around the conduit so that the first and second connecting means are substantially equispaced around the conduit; and

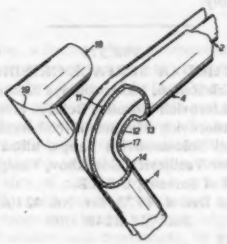
means for inflating the conduit to exert a pulling force between the members to impart angular movement to said first member relative to said second member in said one sense about said axis.

3,958,369

SEALING STRIPS AND METHODS OF MAKING THEM

Lionel J. Mathellier, Chartres, France, assignor to Draftex, S.A., France

Filed Dec. 26, 1974, Ser. No. 536,658
Claims priority, application France, Jan. 9, 1974, 74.00660
Int. Cl.[2] E06B *7/16*
U.S. Cl. 49—479 **12 Claims**



10. A sealing strip according to claim 7, in which the sealing portion has a hollow profile.

3,958,370

SINGLE SLIDE GRINDING MACHINE WITH MEANS FOR SELECTIVELY PRODUCING A RECIPROCATION OF SAID SLIDE

Hugh T. Edgar, Charlestown, N.H., and John W. Lovely, Springfield, Vt., assignors to Bryant Grinder Corporation, Springfield, Vt.

Division of Ser. No. 464,917, April 29, 1974. This application June 16, 1975, Ser. No. 587,081
Int. Cl.[2] B24B *51/00*
U.S. Cl. 51—165.89 **5 Claims**

1. In a metal working machine having a base and a slide assembly mounted on the base for displacement relative thereto, apparatus for selectively producing a reciprocating motion of the slide assembly relative to the base and comprising:

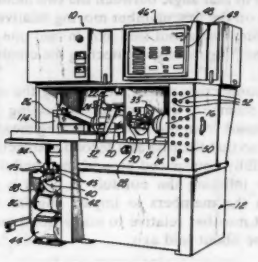
an eccentric cam mounted on the base for rotation relative thereto and having a peripheral contact surface defining a contact point having a reciprocating motion, said eccentric cam being spaced from the slide assembly,

bias means for urging the slide assembly in a first longitudinal direction relative to the base,

an oscillator lever having a fixed end pivotally mounted on the base and a free end engaging the peripheral contact

surface of the eccentric cam for continuous pivotal movement as the cam is rotated,

spacer means selectively insertable between the oscillator lever and the slide assembly for mechanically coupling the oscillator lever and the slide assembly to reciprocate the slide assembly in accordance with rotation of the cam,



power means connected to the spacer means for selectively displacing the spacer into position between the oscillator lever and the slide assembly, said power means including adjustment means for selectively varying the point of contact between the spacer means and the oscillator lever along the length of the oscillator lever between the fixed end and the free end thereby to vary the degree of reciprocating displacement transferred from the cam to the slide assembly.

3,958,371

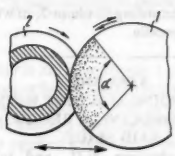
METHOD OF SURFACE GRINDING

Sergei Georgievich Redko, Naberezhnaya Kosmonavtov, 2, kv. 19; Albert Viktorovich Korolev, Bolsaya Gornaya, 170, kv. 8; Anatoly Fedorovich Maxjushin, Naberezhnaya, dom la, kv. 48; Moisei Solomonovich Kreps, ulitsa Gorkogo, 28, kv.1, and Fedor Vasilievich Gorokhov, Vologodskaya ulitsa, 13, kv. 15, all of Saratov, U.S.S.R.

Filed Dec. 4, 1973, Ser. No. 421,635

Int. Cl.² B24B *1/00*

U.S. Cl. 51—291 **1 Claim**



1. A method of grinding a workpiece with a grinding wheel to a desired profile and surface finish, after having subjected the workpiece to initial rough stock removal by a conventional rotational grinding step, the method comprising the steps of supporting the semi-finished workpiece and said wheel in a rotatable manner on substantially parallel, spaced respective axes that lie in a first reference plane; rotating the workpiece in a second reference plane that is substantially perpendicular to said first reference plane; simultaneously rocking said wheel about its axis, also in said second reference plane through an arc of up to 360°, at a substantially constant peripheral speed of up to 100 m/min., thereby imparting the desired surface finish to the workpiece by intermittent abrasive action; reducing the distance between said axes by relative linear movement of one of the workpiece and said wheel with respect to the other, in said first reference plane, as said abrasive action results in at least one of the workpiece and said wheel becoming smaller in diameter; gradually decreasing said rocking arc during the abrasive action from a predetermined initial value to zero, while maintaining the rotation of the workpiece; and maintaining said constant peripheral speed of the grinding wheel as long as said rocking step is performed.

3,958,372

ARTICLE SUPPORTING PANELLING

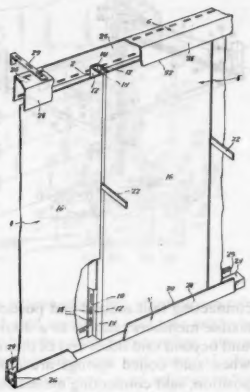
David Benbow, Petitor Works, Torquay, Devon, England

Filed June 17, 1974, Ser. No. 480,551

Claims priority, application United Kingdom, June 19, 1973, 29105/73; Oct. 30, 1973, 50435/73

Int. Cl.² E04B *2/32*

U.S. Cl. 52—36 **8 Claims**



1. Panelling, comprising;

a plurality of infill panels,

each infill panel comprising;

a channel section with a front face and two laterally opposite side flanges extending rearwardly therefrom,

the infill panels being arranged adjacent one another in series, with the opposite side flanges of each two adjoining infill panels close together; and

a plurality of spaced apart upright members;

each upright member comprising:

a narrow channel section having a back wall and two laterally opposite side flanges extending forwardly therefrom;

means defining a vertically extending row of slots in said back wall;

said opposite side flanges of each two adjacent infill panels being received between said opposite side flanges of a respective upright member,

the row of slots on each upright member being set back from the front faces of the respective adjacent infill panels and accessible from between said opposite side flanges of the respective adjacent infill panels over at least part of the length of said row,

whereby

brackets may be secured in the slots and project forwardly beyond said front faces, in which case the close spacing of the adjoining side flanges of the respective adjacent infill panels results in lateral support of the flanges by these side flanges;

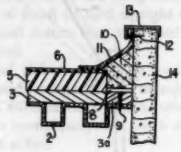
at least one side flange of each infill panel carrying a projection, and

that projection abutting the respective adjoining infill panel side flange to maintain the adjoining infill panel side flanges separated to provide said close spacing.

3,958,373
TWIN MEMBRANE, SELF SEALING, MECHANICALLY FASTENED INSULATED ROOF DECK SYSTEM

Sherman A. Stewart, Rancho Palos Verdes, Calif.; Estel R. Snyder, La Grange, Ill., and David L. Ruff, Harbor City, Calif., assignors to Grefco, Inc., Bala Cynwyd, Pa.

Division of Ser. No. 468,885, May 10, 1974. This application May 14, 1975, Ser. No. 577,443
Int. Cl.² E04D 13/14
U.S. Cl. 52—58 3 Claims



1. In a roof structure comprising:
a. a roof deck and roofing panels havng a weather resistant top surface;
b. said panels being fastened to the roof deck;
c. a protective junction and seal between the roof structure and an element projecting above the roof structure; the improvement comprising
d. a fastener adapted to fasten one of said roofing panels to the roof deck closely adjacent to said projecting element;
e. a welt of self-adhering sealer covering the fastening means and disposed between adjacent surfaces of the roofing panel and the projecting element;
f. a tough, weather resistant membrane strip which is wider than the seal;
g. the membrane strip being fastened along an edge thereof to the roofing panel structure surface and along another edge to the projecting element.

3,958,374
ANCHOR ASSEMBLY

Klaus Gobel, Am Forst, 55 Trier, Germany

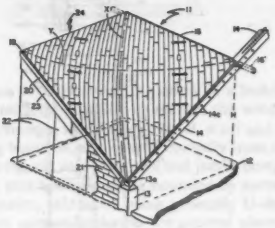
Continuation-in-part of Ser. No. 458,830, April 8, 1974, abandoned. This application Aug. 20, 1975, Ser. No. 606,013
Claims priority, application Germany, Apr. 21, 1973, 2320445
Int. Cl.² E04D 1/36, 13/14
U.S. Cl. 52—60 2 Claims

1. An anchor assembly for an edge portion of a flexible roof sheet including a hollow section rail adapted to be mounted on an upright wall projecting upward from a roof edge, such rail having a horizontal slot opening into the hollow of the rail and bounded by upper and lower generally coplanar flanges, the improvment comprising the roof sheet marginal portion being thickened and including lip means spaced from and projecting oppositely from the roof sheet edge for seating behind one of the rail flanges and the rail including a hollow extension forming pocket means for reception of the roof sheet edge for securing the thickened roof sheet marginal portion in the hollow section rail.

3,958,375
PREFABRICATED HYPERBOLIC PARABOLOID ROOF

Daniel F. Tully, 110 Ellis Farm Lane, Melrose, Mass. 02176

Filed Apr. 1, 1974, Ser. No. 456,522
Int. Cl.² E04B 1/32
U.S. Cl. 52—80 10 Claims



1. In a building, a frame (10) in combination with a hyperbolic paraboloid roof shell section (11); said frame (10) comprising four boundary beams (14, 16, 17 and 20); said roof shell section being structurally adequate and attached to said beams and defined by the translation of a convex parabola along a concave parabola perpendicular to it to form a hyperbolic paraboloid; said roof shell section comprising a single layer of a plurality of prefabricated structural components, (25, 35 and 45), each made of laminated wood; each said prefabricated component having a joining edge parallel to the joining edge of another said component, all said components being oriented in the same direction; each said joining edge extending diagonally between two adajecent said beams; said components being attached to one another along their joining edges by fastening means which provide tensile and shear strength for the joint; said fastening means being located adjacent said joining edges and being sufficient to provide tensile and shear strength for the joint without any supplemental or additional supporting means so as to provide a structurally adequate joint.

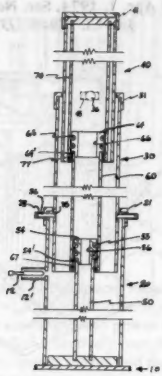
6. In a building, a frame (10) in combination with a hyperbolic paraboloid roof shell section (11); said frame (10) comprising four boundary beams (14, 16, 17 and 20); said roof shell section being structurally adequate and attached to said beams and defined by the translation of a convex parabola along a concave parabola perpendicular to it to form a hyperbolic paraboloid; said roof shell section comprising a single layer of a plurality of prefabricated structural components, (25, 35, and 45), each made of a laminate of resin-impregnated glass fibers containing an insulating filler, each said prefabricated component having a joining edge parallel to the joining edge of another said component, all said components being oriented in the same direction; each said joining edge extending diagonally between two adjacent said beams; said components being attached to one another along their joining edges by fastening means which provide tensile and shear strength for the joint; said fastening means being located adjacent said joining edges and being sufficient to provide tensile and shear strength for the joint without any supplemental or additional supporting means so as to provide a structurally adequate joint.

3,958,376

EXTENDIBLE TOWER STRUCTURE

Preston M. Campbell, Fort Mill, S.C., assignor to Zip Up, Inc., Rock Hill, S.C.

Filed Feb. 15, 1974, Ser. No. 442,845
Int. Cl.² B66F *11/04*
U.S. Cl. 52—115 **7 Claims**



1. An extendible tower structure comprising:

a. a base;

b. a hydraulic fluid reservoir secured to said base;

c. a plurality of nestable tower sections received on said base, a largest of said sections being secured to said base, each adjacent section having means received thereon to engage and raise the next adjacent smallest section;

d. a plurality of nestable hydraulic cylinders received within said tower sections, a largest of said cylinders being permanently secured to the smallest tower section and the smallest of said cylinders being permanently secured to said base and in communication with said hydraulic fluid reservoir, said smallest cylinder and each intermediate cylinder having a piston located thereon, said pistons having sealing rings therearound and producing a seal along the inside wall of the next adjacent larger cylinder, each piston having a fluid port therein, and each cylinder engaging the next adjacent smallest cylinder and raising same during raising of the tower; and

e. means to controllably supply hydraulic fluid under pressure into said smallest cylinder, said fluid passing through said cylinders to said largest cylinder, and raising said cylinder one at a time, whereby said tower is raised thereby.

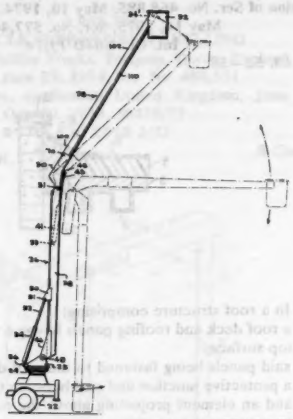
3,958,377

LIGHTWEIGHT HIGH STRENGTH BOOM CONSTRUCTION

Edwin Earl Milner, Jr., 1710 High Point Ave., Richmond, Va. 23230

Division of Ser. No. 483,069, June 25, 1974, Pat. No. 3,947,191. This application Feb. 21, 1975, Ser. No. 551,845
Int. Cl.² E04H *12/18*
U.S. Cl. 52—118 **23 Claims**

1. An articulated boom structure comprising a support means, a first hollow boom member of tubular construction having an inner end mounted on said support means for pivotal movement about a first horizontal axis, a second hollow boom member, pivotal connector means mounted for pivotal movement about a second horizontal axis adjacent the outer end of said first hollow boom member, said pivotal connector means including a boom support stub member, said second hollow boom member being formed of a hollow shell member of tubular construction including a coupling portion supportingly connected to said bottom support stub member and an outer boom portion extending outwardly from said coupling portion and comprising a top wall having progressively decreasing width from its inner end to its outer end, opposed side walls having downward convergence with said downward convergence of said opposed side walls progressively decreasing from the inner to the outer end of said outer boom portion and an arcuately curved bottom connector wall portion extending between lower portions of said opposed side walls and having a center of curvature internally of said second hollow boom member.

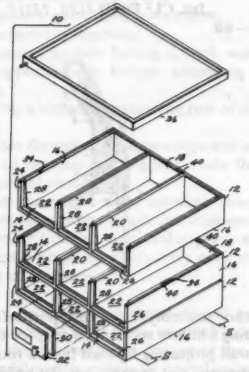


3,958,378

BURIAL CRYPT

Gerardo Omeechevarria, P.O. Box 10881, Caparra Heights Sta., P.R. 00922

Continuation of Ser. No. 313,337, Dec. 8, 1972, abandoned. This application Oct. 22, 1974, Ser. No. 516,961
Int. Cl.² E04H *13/00*
U.S. Cl. 52—136 **5 Claims**



1. A self-contained modular burial crypt for forming a mausoleum comprising

a. a precast integral modular unit having a base portion, an upright back wall portion, at least two terminal upright

side wall portions and at least one upright divider wall portion positioned intermediate said terminal side wall portions for forming at least two complete open-top, openfront compartments,

b. a recess means formed in the open-front of each compartment of said unit,

c. closure means fitted within each of said recess means so as to close the open-front of each of said compartments,

d. a resilient sealant means for sealing and securing surfaces abutting said sealant means,

e. canal means extending in the longitudinal direction on the top surface of each of said upright wall portions of said unit, said canal means receiving said resilient sealant means therein, and

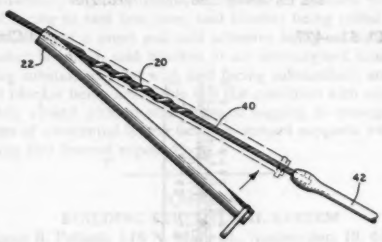
f. a removable roof slab common to and for completely covering all of said compartments of said unit, said slab having a bottom surface thereof that abuts said resilient sealant means to completely seal each of said compartments from each other.

3,958,379

APPLIANCE FOR LINEAR BODIES

Harrison L. Williams, Euclid, and Detre M. Banhidy, Lakewood, both of Ohio, assignors to Preformed Line Products Company, Cleveland, Ohio

Filed Nov. 6, 1974, Ser. No. 521,331
Int. Cl.² E04H *17/22*
U.S. Cl. 52—145 **8 Claims**



1. An improved appliance for linear bodies comprising:

a tubular member adapted to be mounted in generally coaxial alignment on a linear body;

a helically preformed portion secured at one end to said tubular member and extending longitudinally therein in a first direction and having an internal diameter and pitch length comprising means to permit wrapped engagement with said linear body in slidable relationship therewith in said direction said helically preformed portion extends but in substantially non-slidable relationship in the opposite direction;

said tubular member having a first slit extending its entire length and a second slit extending only a portion of its length generally coincident with said helically preformed portion, said first and second slits thereby forming a space through which said helically preformed portion may flexibly displace; and

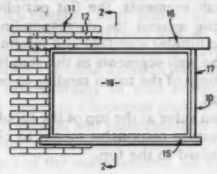
means disposed only at the end of said tubular member toward which said helically preformed portion extends for locking said tubular member in final mounted disposition on said linear body, said locking means comprising means for limiting the circumferential expansion of said tubular member as said member is subjected to expanding forces in said final mounting disposition.

3,958,380

BUILDING COMPONENTS

Desider Golten, Hengoed, Wales, assignor to BKL Alloys Limited, Birmingham, England

Filed Mar. 6, 1975, Ser. No. 555,935
Int. Cl.² E06B *1/00, 3/00*
U.S. Cl. 52—208 **8 Claims**



2. A sub-frame for supporting a window in a building and providing a rectangular aperture to receive the window, the sub-frame comprising a load-bearing lintel, a sill and parallel jambs extending between, and spaced inwardly from the ends of the lintel and the sill, said lintel, sill and jambs being rigidly interconnected; said aperture being bounded by parts of said lintel, sill and jambs; said parts being generally U-shaped in section in planes perpendicular to the general plane of the window to be received in the aperture, the bases of the U-section of the parts defining the edges of the aperture and the limbs of the U-section providing inner and outer abutment surfaces extending away from the centre of the aperture around the whole of the periphery thereof; said lintel having an inner part adapted to support, over the sub-frame, the inner skin of bricks of a cavity wall in which the sub-frame is received; an outer part adapted to support the outer skin of bricks of said wall over the sub-frame; and an inclined part which extends across the cavity and which joins the inner and outer parts, the inner part being spaced upwardly from the outer part.

3,958,381

CONCRETE FILLED TAPERED TUBULAR TOWER

Roy E. Meyer, Red Wing, Minn., assignor to Meyer Industries, Inc., Red Wing, Minn.

Filed Jan. 20, 1971, Ser. No. 107,985
Int. Cl.² E04C *3/34*; E04H *12/12*
U.S. Cl. 52—303 **1 Claim**

1. A tower to be supported on a base to carry a load at an elevated location

comprising a free-standing upright standard of tubular construction and being constructed of high tensile strength steel plate, the standard being tapered convergently in an upward direction, and having an interior surface free of inward protuberances, the tubular standard having a

cross-sectional shape with a plurality of flat wall segments in each quadrant, each of said wall segments being oriented at obtuse angles with respect to adjoining wall segments, and

a concrete core in the tapered tubular standard and bearing against the inner periphery of the stnadard, the periphery of the core having a plurality of flat surfaces in each quadrant and oriented at obtuse angles with respect to adjoining wall segments, the flat peripheral surfaces of the core lying against the corresponding flat wall segments of the tubular standard and minimizing any deformation of the wall segments as the standard flexes under various loadings of the tower tending to bow and twist the standard, and

a normally open valve at the top of the tubular standard and having a pressure responsive means to close as concrete fills the standard to the top.

3,958,382

ANCHOR FOR INTERCONNECTING TWO RELATIVELY MOVABLE COMPONENTS OF A STRUCTURE

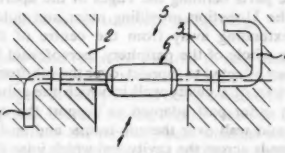
Hans Walt, Paradies, Switzerland, assignor to Keller AG Ziegeleien, Pfungen, Switzerland

Filed Oct. 31, 1974, Ser. No. 519,590

Claims priority, application Switzerland, Nov. 2, 1973, 15464/73

Int. Cl.² E04B *1/38*

U.S. Cl. 52—713 **7 Claims**



1. An anchor for interconnecting two relatively movable components of a structure, comprising two anchoring elements each intended to be secured to one of the structure components, a compensation component for hingedly interconnecting said two anchoring elements, said compensation component having fixed stops, said anchoring elements bearing against the fixed stops of the compensation component in a traction direction of said anchoring elements, said anchoring elements having confronting ends each possessing at least a substantially semi-spherical-shaped head, said compensation component being constructed in the form of a substantially sleeve-like member which surrounds said heads in a ball-and-socket like manner, a support device arranged in said compensation component between said heads, and a restoring device provided for the compensation component and cooperating with the anchoring elements for substantially coaxially aligning the anchoring elements with respect to one another when the anchor is in an unloaded state.

3,958,383

GLAZING SYSTEM

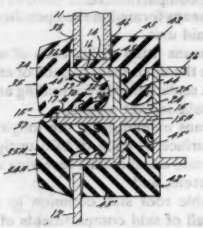
John A. Dallen, Port Clinton, Ohio, assignor to The Standard Products Company, Cleveland, Ohio

Filed Mar. 19, 1975, Ser. No. 559,801

Int. Cl.² E04B *1/62;* **E04F** *15/14*

U.S. Cl. 52—400 **26 Claims**

1. Means for positioning a windowpane panel or the like in a building structure comprising in combination with a rigid frame structure for receiving and positioning the panel, said frame structure including a pair of channels bordering the panel and one of which opens on one side of the panel and the other of which opens on the other side of the panel, but neither of which channels opens toward the panel, a pair of elastomeric stop members, each of which includes a stop retaining leg flange fitted in one of said channels and a panel holding leg flange integral with and spaced from the stop



retaining leg flange and overlying and bearing against a face of the panel.

3,958,384

STRUCTURE ASSEMBLED OF THE UNIT BODIES HAVING STONE-LIKE TYPE SHELLS AND AN INSULATING INSERT

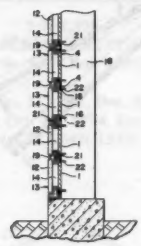
Naomitsu Megumi, Funabashi, Japan, assignor to Naomitsu Megumi, Funabashi and Tokyo Plywood Kabushiki Kaisha, Tokyo, both of, Japan

Division of Ser. No. 413,052, Nov. 5, 1973, Pat. No. 3,903,668. This application Apr. 24, 1975, Ser. No. 571,120

Claims priority, application Japan, Nov. 17, 1972, 47-115432; Dec. 7, 1972, 47-122689

Int. Cl.² E04B *2/88, 2/58, 1/76, 1/04*

U.S. Cl. 52—477 **3 Claims**

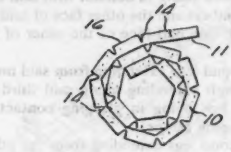


1. A construction arrangement for a structure such as a wall or floor comprising a unit body, said unit body including a frame member having four side plates disposed about an opening, each of said side plates having an outer flange means and an inner flange means, said inner flange means circumscribing said opening in said frame, a stuffing box, a noncombustible material within said stuffing box, anchoring means securing said stuffing box to said inner flange means to thereby close said opening, cement mortar disposed on at least portions of said stuffing box and said frame member, said cement mortar being arranged relative to said outer flange means so as to form a circumferential groove between said cement mortar and said outer flange means, said groove providing access to said outer flange means to facilitate affixing the latter to said structure, means securing a plurality of said unit bodies to said structure in an arrangement whereby said plurality of unit bodies are arranged adjacent to one another so that a portion of the circumferential groove of one unit body faces a portion of the circumferential groove of another adjacent unit body, and interconnecting means disposed in said circumferential grooves for interconnecting said adjacent unit bodies to one another.

3,958,385
INSULATION BLANKET AND METHOD AND APPARATUS FOR MAKING SAME

John Bondra, Jr., Macedonia, and William R. Ruhling, Northfield, both of Ohio, assignors to Metal Buildings Insulation, Inc., Brooklyn Heights, Ohio

Continuation of Ser. No. 421,345, Dec. 3, 1973, abandoned.
This application Mar. 7, 1975, Ser. No. 556,285
Int. Cl.² E04B 1/74
U.S. Cl. 52—404 7 Claims

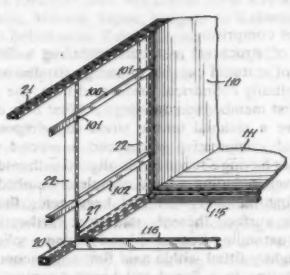


1. A rolled insulation blanket comprising an elongated insulation body having first and second opposite faces and being formed of a loose mat of fibers such as fiberglass or the like, said body providing springback causing it to assume a normal flat and uncompressed position when unrestrained, said body being compressible and bendable from said normal position, a facing against said first face, said body having a plurality of lateral cuts extending from said second face to a location spaced from and substantially adjacent to said first face, said blanket being rolled with said facing inside and with said cuts open with a hinge-like action about a hinge line substantially adjacent to said facing, and an adhesive bonding said facing to said first face, said blanket being rolled while said adhesive is unset and said adhesive being set while said blanket is rolled, said blanket in an unrestrained condition being substantially flat with said facing substantially smooth, said blanket being installable in a flat condition with said cuts tightly closed without stretching or sagging in unsupported spans of substantial length between spaced supports with the facing side thereof exposed.

3,958,386
BUILDING STRUCTURAL SYSTEM

Eugene B. Pollock, 116 N. Mary St., Assumption, Ill. 62510

Continuation of Ser. No. 458,760, April 8, 1974, abandoned.
This application Aug. 15, 1975, Ser. No. 604,945
Int. Cl.² E04B 2/60
U.S. Cl. 52—488 5 Claims

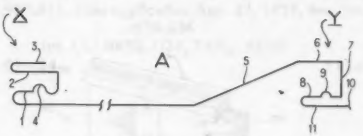


1. A building structural system comprising, a plurality of preformed elongate structural elements positionable in both angular and parallel interrelation with adjacent parts of elements in abutting relation, said elements including a sill element, a plate element, and a plurality of vertically extending stud elements each having a lower end directly engaging and supported by said sill element to define the basic wall frame of a building, each of said elements being of metal sheet material and having a box cross-section with a full width planar panel, a pair of planar panels in spaced parallel relation to said full width panel, and a pair of interconnecting planar panels, each of said planar panels having a series of uniformly spaced-apart fastener-receiving and locking devices and with each of said devices being comprised of a pair of flanges deformed from the planar panel to extend angularly toward each other with closely adjacent free ends and define a narrow elongate slot for receipt of a fastener, all of said series of devices having the same spacing between devices and all of said series of devices being uniformly interrelated to have a device from each planar panel at the same location lengthwise of the structural element, said plurality of stud elements having their interconnecting panels in a common plane with said interconnecting panels of said sill and plate elements to place a plurality of said fastenerreceiving and locking devices on the interconnecting panels of the stud elements, sill element and plate element in said common plane, and a plurality of members of different shapes interconnecting said elements in the desired interrelation and each having fasteners in the form of integral planar tabs extending therefrom and inserted into the slots of several ones of said locking devices and held against removal by said pairs of flanges, each of said planar tabs having a width substantially equal to the length of said slot to avoid play therebetween lengthwise of said slot.

3,958,387
TRANSVERSE ROOFING STRIP

Sadao Kandabashi, 1-1, 2-chome, Takanoo, Miyakonojo, Miyazaki, Japan

Filed Mar. 17, 1975, Ser. No. 559,388
Claims priority, application Japan, Mar. 20, 1974, 49-32844[U]
Int. Cl.² E04D 1/06, 3/16
U.S. Cl. 52—531 7 Claims



1. A transverse roofing strip, comprising:
a. an oblong sheet member (A) including;
i. an upper edge (X) having four-fold upward bends (1), (2) and (3), including a first bend (3), a second bend (2) connected at one end to said first bend (3) and extending from said one end in a direction opposite said first bend (3), a third bend (1) connected at one end to the other end of said second bend (2) and extending from said one end of said third bend (1) first in the opposite direction of said second bend (2) and then in the same direction as said second bend (2), said third bend (1) extending first in the opposite direction having a fist semicircular arching ridge (4);
ii. a lower edge (Y);
iii. a sheet portion extending from said third bend (1) toward said lower edge (Y) to interconnect said upper edge (X) and said lower edge (Y); said portion including a first horizontal part, and a second part (5) extending from said first part and bent at a position close to said lower edge (Y) to provide an upward inclination at an angle of about 160° from said first part;
iv. said lower edge (Y) including a portion (6) connected at one end to said second part and parallel to said first part, a vertical bend (7) connected at one end to the other end of said parallel portion (6), a reverse bend (8) connected at one end to the other end of said vertical bend (7) and extending in the direction of said upper edge (X), said reverse bend (8) having a second

semicircular arching ridge (9), and an additional bend (11) connected at one end to the other end of said reverse bend (8) and extending in a direction opposite to the direction of said reverse bend (8), said additional bend (11) having another end (10) which is downwardly arcuately curved; wherein said first arching ridge of one transverse roofing strip may be placed in snag engagement with said second arching ridge of another transverse roofing strip; and

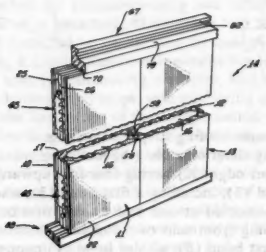
b. an oblong sheet point tack (B), which is covered by said oblong sheet member, for retaining said second part (5); said point tack including a right angled upward bend (12) and an inverted-V-shaped bend (13) connected at one end to said upward bend (12), a bend (14) having one end folded downwardly from the other end of said inverted-V-shaped bend (13) and extending oppositely said inverted-V-shaped bend (13) in the direction of said upward bend (13), a rising portion (15) connected at one end to the other end of said oppositely extending bend (14) and extending upwardly and at a right angle from the other end of said oppositely extending bend (14), a parallel bend (16) extending at one end from the other end of said rising portion (15), said parallel bend (16) extending parallel to said oppositely extending bend (14), said parallel bend (16) and said oppositely extending bend (14) extending on opposite sides of said rising portion (15), and a bend (17) having one end folded from the other end of said parallel bend (16) and extending oppositely said parallel bend (16) back towards said rising portion (15).

3,958,388

MODULAR BUILDING STRUCTURES

Turner C. Hawes, Box 162, Carpenteria, Calif. 93013

Filed Sept. 6, 1974, Ser. No. 503,605
Int. Cl.² E04C 1/10
U.S. Cl. 52—584 **12 Claims**



1. A structural assembly comprising:

two structural members joined together in end-to-end relationship by at least one clamp,

each member having a side face, an end face and a third face, said end face extending between said side face and said third face, said third face being opposite said side face,

a longitudinal groove in said third face adjacent said end face,

a wall of said groove nearest the end face defining a gripping ramp for said clamp,

an entrance ramp in each member adjoining the end face and the third face,

said members having in allochiral relationship, said clamp having a web having two back-to-back faces, a plurality of pairs of resilient opposing first side legs extending from opposite edges of said web in one direction, said pair of first legs and said web defining first channels in cross section,

a plurality of pairs of resilient opposing second side legs extending from opposite edges of said web in an opposite direction to said one direction, each pair of second side legs and said web defining second channels in cross section,

said first and second legs extending from one of said opposite edges each having a returning lip adjacent its outer end,

each lip having a curved outer face and an edge directed toward said web, and

one face of said web being in contact with said end face of one of said members and the other face of said web being in contact with said end face of the other of said members,

said first and second legs extending from said one opposite edge of said web extending along said third face, said edges of said lips being in gripping contact with said respective gripping ramps,

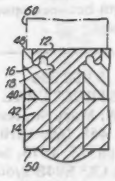
said first and second legs extending from the other of said opposite edges of said web being in gripping contact with said respective side faces.

3,958,389

RIVETED JOINT

Roger B. Whiteside, Cinnaminson, N.J., and Harry T. Long, Jr., Jamison, Pa., assignors to Standard Pressed Steel Co., Jenkintown, Pa.

Continuation of Ser. No. 885,224, Dec. 15, 1969, abandoned, which is a continuation-in-part of Ser. No. 859,533, April 2, 1969, Pat. No. 3,551,015, which is a continuation of Ser. No. 709,654, March 1, 1968, abandoned. This application Dec. 4, 1972, Ser. No. 311,991
Int. Cl. F16b 19/04
U.S. Cl. 52—758 D **5 Claims**



1. A joint comprising:

a stack of structural members including a first member made of material capable of being extruded and having a first initially cylindrical preformed hole, the material of said first member surrounding said first hole conditioned to have a residual tensile stress superimposed upon a residual compressive stress and a second preformed member having a second hole aligned with said first hole,

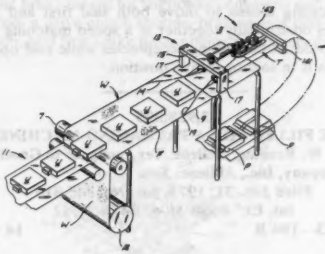
and a rivet including a head completely embedded within said first member with said head being flush with an outside surface thereof, said rivet further including a shank extending from said head having a solid cross-section tightly fitted within said first and second holes and terminating in a flared tail bearing against an outside surface of said second member, said shank having a recessed portion formed therein adjacent said head, said head having axially projecting means on the underside thereof including a convexly arcuate surface on the extremity thereof remote from said head causing a controlled cold flow of said material to said first member during embedment of said head therein, said cold flow material extending into said recessed portion and causing compressive stresses around said first hole.

3,958,390

PACKAGING

Frank E. Pringle, Jr., Sheboygan; Harvey Heiner, New Holstein, and Gary Lee Gehrke, Madison, all of Wis., assignors to Hayssen Manufacturing Co., Sheboygan, Wis.

Filed Jan. 2, 1975, Ser. No. 538,136
Int. Cl.² B65B 31/04
U.S. Cl. 53—22 A 14 Claims



1. The method of packaging units in flexible sheet material which is heat-sealable at least on one face thereof, comprising forming into a tube a continuous web of said material as it is fed foward with said one face of the material on the inside of the tube by bringing the side margins of the web into inside-face-to-inside-face engagement at a sealing station, said side margins converging toward one another as they travel toward and meet at said station, heating inside faces of said margins as they converge toward one another and meet at said station for heat-sealing them together by delivering hot gas between said margins and directing it to flow against the inside faces of said margins to heat said inside faces as said margins travel toward said sealing station, the gas impinging on said inside faces as said margins enter the sealing station, pressing the heated margins to seal them together at said station, and forming transverse seals across the tube at package length intervals with a unit to be packaged in the tube between successive transverse seals, the side margins coming together in a V with its apex at the sealing station and the gas being directed in downstream direction in relation to the travel of the web toward the apex of the V to impinge on the inside faces of the side margins as they meet at the apex of the V.

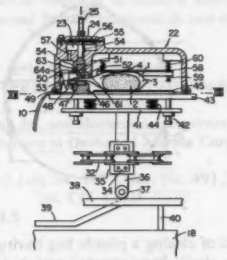
3,958,391

VACUUM PACKAGING METHOD AND APPARATUS

Eitaro Kujubu, Mihara, Japan, assignor to Kabushiki Kaisha Furukawa Seisakusho, Tokyo, Japan

Filed Nov. 14, 1975, Ser. No. 632,123
Claims priority, application Japan, Nov. 21, 1974, 49-134463
Int. Cl.² B65B 31/02
U.S. Cl. 53—22 B 11 Claims

1. A method of vacuum packaging a commodity, particularly a livestock meat for food, which comprises: charging a specific quantity of the commodity into a package bag made of a heat-shrinkable plastic film of a substantially constant overall length, which is sufficient for packaging said quantity ranging from a relatively small quantity to a relatively large quantity of the commodity, and having a closed bottom end and an open top end, in a manner to leave a specific unfilled part at the bottom end of the bag; placing the bag thus charged in a specific position in an evacuating device of a vacuum packaging apparatus; placing the bag in said specific position under a vacuum thereby to evacuate the interior thereof, excessive inflation of the bag being prevented by means provided therefor; sealing the bag with a seal part extending transversely thereacross on the side of the commodity opposite from the bottom end of the bag, a specific unfilled part being left between the seal part and the commodity; at the same time cutting the bag with a cut extending transversely thereacross except for an uncut part for temporarily retaining the open end of the bag, constituting a surplus part, attached to the remainder of the bag, the cut being on the outer side of



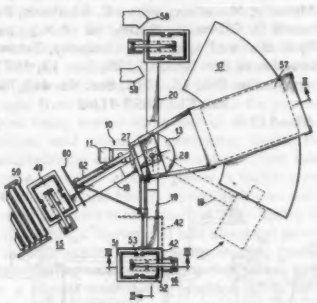
the seal part; removing the surplus part; and immersing the resulting vacuum package in hot water, preferably at a temperature of 80°C to 85°C for a period of the order of 2 to 10 seconds thereby to cause heat shrinkage of the bag.

3,958,392

METHOD AND APPARATUS FOR HEAT SHRINKING FILM ABOUT ARTICLES

Robert L. Beninger, Sheboygan, Wis., assignor to H. G. Weber and Company, Inc., Kiel, Wis.

Continuation-in-part of Ser. No. 421,989, Dec. 5, 1973, Pat. No. 3,910,011. This application Apr. 23, 1975, Ser. No. 570,636
Int. Cl.² B65B 1/24, 53/02, 63/02
U.S. Cl. 53—24 7 Claims



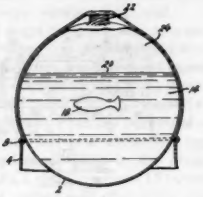
1. The method of packaging articles in a heat shrinkable film which comprises stacking a plurality of such articles on the base of an inside out heat shrinkable bag, compressing the stack a predetermined amount, raising the sides of the bag over the compressed stack along the sides of said bag and overlapping a portion of the top of said stack, holding the overlapped portion against the top of said stack, and heat shrinking said bag about said stack while said contents are so compressed.

3,958,393

FISH PACKAGE AND MODE OF USE THEREOF

Kevin F. Whitener, 5103 Karen Blvd., Apt. 24C, Riverside, Mo. 64151

Filed July 11, 1974, Ser. No. 487,777
Int. Cl.² B65B *3/04*
U.S. Cl. 53—37 1 Claim



1. A method of closing a pliable bag having an open mouth and an endless elastic band secured peripherally thereto adjacent said mouth and normally restricting the diameter of said mouth, with a water-tight seal, said method consisting of the successive steps, partially filling the bag with water wherein said bag is filled to a depth less than one-half of the distance from said elastic band to the closed end thereof,

a. twisting the bag tightly to form a water-tight seal at a point above the water level thereof but below said elastic band wherein said twisting is performed at a point of the bag closer to said elastic band than the water level therein, but spaced from said elastic band by a distance greater than one-half the distance from said twist to the closed end of said bag, and

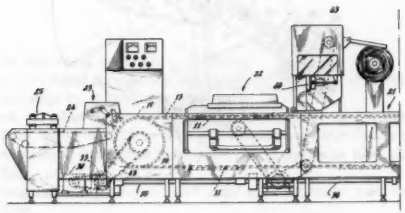
b. everting the portion of said bag intermediate said twist and said elastic band about the portion of said bag containing water, whereby said elastic band is resiliently extended and grips the filled bag portion to secure said twist against loosening whereby said elastic band grips the filled portion of said bag at a point thereof which is reducing in diameter away from said twist.

3,958,394

CONTINUOUS MOVEMENT PACKAGING MACHINE

Reid A. Mahaffy, Montclair; James C. Kimbaris, Parsippany, and Russell D. DiDonato, Nutley, all of N.J., assignors to Mahaffy & Harder Engineering Company, Totowa, N.J.

Continuation of Ser. No. 217,209, Jan. 12, 1972. This application Feb. 15, 1974, Ser. No. 442,780
Int. Cl.² B65B *31/02*
U.S. Cl. 53—112 A 29 Claims



1. In packaging apparatus for making sealed packages of the type including a product-containing receptacle and a top sealed to the receptacle around the periphery thereof; said apparatus comprising:

conveyor means including support means arranged to engage packaging material and to transport it along a horizontal path at substantially constant speed to permit sequential packaging operations to be performed thereon;

said support means including means to fixedly hold said material longitudinally immobilized relative to said conveyor means;

operating means comprising first and second means respectively above and below said path of movement with at least one of said means being arranged to reciprocate vertically towards said path into pressure-engaged operative position with the other means effectively embracing portions of said packaging material with viselike pressure while performing packaging operations thereon; and

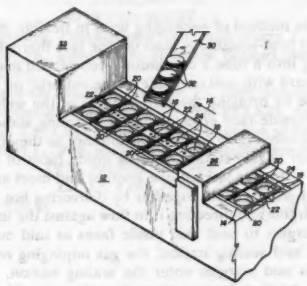
reciprocating means to move both said first and second means horizontally together at a speed matching that of said product-containing receptacles while said operating means is in said operative position.

3,958,395

DIE FILLER FOR A PACKAGING MACHINE

Nathanial W. Reading, Abilene, Tex., assignor to Gooch Packing Company, Inc., Abilene, Tex.

Filed Jan. 31, 1975, Ser. No. 545,810
Int. Cl.² B65B *5/06;* B41B *11/62*
U.S. Cl. 53—184 R 14 Claims



1. In a packaging machine, the combination comprising:

a die housing,

a projection rigidly attached to said die housing,

a die filler dimensioned to fit within said die housing and having a cavity for receiving a product to be packaged, and

means covering a recess in the bottom of said die filler and forming an aperture in said die filler having a first portion dimensioned to receive said projection when said die filler is placed in said die housing, said aperture having a second portion for receiving said projection to lock said die filler to said die housing by sliding said die filler relative to said die housing to register said projection in said second portion of said aperture.

3,958,396

LAWN MOWER REEVING SYSTEM

John A. Kelley, deceased, late of Atlanta, Ga., and Alice R. Kelley, temporary administratrix, 55 W. Belle Isle Road NE., Atlanta, Ga. 30342

Filed June 21, 1974, Ser. No. 481,833
Int. Cl.² A01D *75/28*
U.S. Cl. 56—7 3 Claims

1. A ground working implement control apparatus comprising in combination:

a. a movable automatic ground working implement capable of moving upon the ground;

b. a control element mounted upon ground, said control element connected to said working implement by at least a first cable and a second cable;

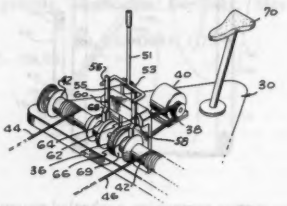
c. said first cable having two ends, one end fixed to substantially a first side of said movable working implement, and

the other end selectively wound about a first spool rotably mounted on said control element;

d. said second cable having two ends, one end fixed to substantially a second side of said movable working implement, and the other end selectively wound about a second spool rotably mounted on said control element;

e. said first and said second spools being selectively rotatable individually, whereby said working element can be selectively extended from, drawn toward, and directionally turned relative to, said control element;

f. first brake means for frictionally engaging said spool away from a drive clutch thereby braking said first spool rotation, said first brake means being selectively disengagable



with said first spool and including a first frictionally engaging lever;

g. second brake means for frictionally engaging said spool away from said drive clutch thereby braking said second spool rotation, said second brake means being selectively disengagable with said second spool and including a second frictionally engaging lever;

h. means for driving said spools through respective clutches free of frictional engagement of said levers wherein each of said levers have one end selectively engagable with its respective spool; and selectively engageable with said brake means whereby upon operation selectively said first brake means, said second brake means and said first and said second brake means may be engaged.

3,958,397

TORQUE LIMITING DEVICES

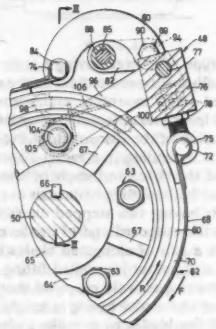
Rodney A. Stiff, Bundaberg, Australia, assignor to Massey-Ferguson (Australia) Limited, Sunshine, Australia

Filed Mar. 6, 1974, Ser. No. 448,590

Claims priority, application United Kingdom, Apr. 4, 1973, 16058/73

Int. Cl.² A01D *75/18*; **F16D** *7/02*, *43/21*

U.S. Cl. 56—10.3 **9 Claims**



1. A crop harvesting machine having drivable crop treatment apparatus characterized in that the drive to the crop treatment apparatus is transmitted through a torque-limiting device comprising first and second friction elements, a control mechanism operable to effect driving engagement of the friction elements and to effect release thereof whereby drive may be established and interrupted respectively between the friction elements and actuating means operably attached to the first and second friction elements for actuating the control mechanism to interrupt drive between the first and second friction elements in response to relative movement between the first and second friction elements in one direction.

3,958,398

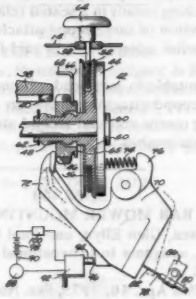
STARTER INTERLOCK FOR SELF-PROPELLED LAWN MOWER

William Fuelling, Jr., and Herbert A. Jespersen, both of Galesburg, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed July 24, 1974, Ser. No. 491,367

Int. Cl.² A01D *75/20*

U.S. Cl. 56—10.5 **14 Claims**



10. A lawn mower including a frame, a cutter blade rotatably supported on said frame, a ground wheel rotatably mounted on said frame and supporting said frame for movement of the mower along the ground, an internal combustion engine having an electric starter for starting said engine, a drive mechanism for selectively connecting said engine in driving engagement with said wheel to propel the mower, said drive mechanism including a control means which is movable between a drive position where said engine is drivingly engaged with said wheel and a neutral position where said engine is disengaged from said wheel, and means for preventing said engine from being started when said control means is in said drive position, said means for preventing engine starting including an electrical circuit for interconnecting said electric starter with a source of electric power, a switch connected in said electric circuit and having an actuation means for selectively moving said switch to a position interrupting the circuit between said electric starter and said electrical power source, and said means for preventing engine starting further including means actuating said switch actuation means to move said switch to a circuit interrupting position when said control means is in said drive position.

3,958,399

HEADER ATTACHMENT STRUCTURE

Ernest A. Schoeneberger, Leola, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Feb. 18, 1975, Ser. No. 550,335

Int. Cl.² A01D *47/00*

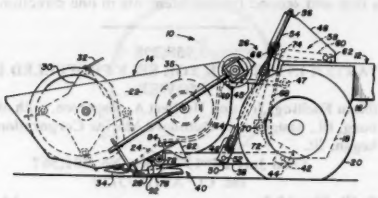
U.S. Cl. 56—15.8 **7 Claims**

1. In a crop harvesting machine having a mobile frame adapted to move across a field, a crop harvesting header and means for suspending said header from said frame so as to dispose said header in a harvesting position adjacent the field

and provide vertical flotation of said header with respect to the field with said suspending means including elongated means mounted on said frame and extending outwardly therefrom, improved structure for attaching an outer end of said elongated means to said header, comprising:

first attaching means mounted to said header;

second attaching means mounted to said outer end of said elongated means of said header suspending means and



having an upper opening through which to receive said first attaching means in a seated relationship therein such that a portion of said second attaching means surrounds and underlies a lower side of said first attaching means; and

means mountable in said header in underlying relationship to said second attaching means so as to retain said first attaching means and said second attaching means in said seated relationship.

3,958,400

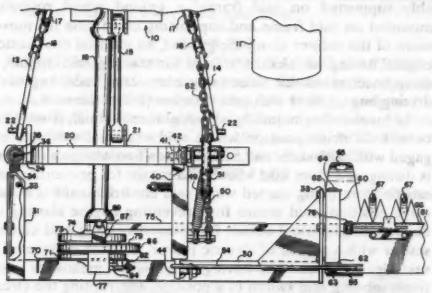
SICKLE BAR MOWER MOUNTING APPARATUS

Robert Sorensen, Glen Ellyn, and Paul C. Gordon, Hinsdale, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Apr. 10, 1975, Ser. No. 566,879

Int. Cl.² A01D *35/08*

U.S. Cl. 56—12.6 **9 Claims**



1. A sickle bar mower adapted for attachment to a tractor comprising:

a hitch frame;

coupling frame means comprising a transversely extending drag bar and a transversely extending cutterbar attached thereto, said cutterbar including a transversely reciprocating sickle;

sickle drive means mounted on said coupling frame means, said drive means being drivable from a source of power associated with said tractor; and

a pair of generally fore-and-aft extending links interconnecting said hitch frame and said coupling frame means to form a generally horizontal four bar parallel linkage, one joint of said linkage being restrained from pivotal movement in the horizontal plane, the link adjacent said joint comprising metallic spring means resilient in the transverse direction.

3,958,401

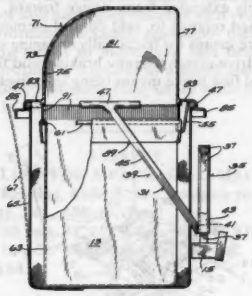
GRASS COLLECTION APPARATUS

Eugene C. Carpenter, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Sept. 5, 1974, Ser. No. 503,348

Int. Cl.² A01D *35/22*

U.S. Cl. 56—202 **13 Claims**



1. A lawn mower comprising a wheeled structure adapted for travel over the ground and a grass clipping collection apparatus including a grass catcher support frame supported by said structure and including a first frame portion adapted to support a cover and a second frame portion adapted to support a grass clipping collection bag, and a bag supporting structure supported by said first frame portion in position to enclose and additionally support the collection bag and including means for facilitating removal of the collection bag from said second frame portion and said bag supporting structure.

3,958,402

CUTTER BLADE MOUNTING FOR A ROTARY MOWER

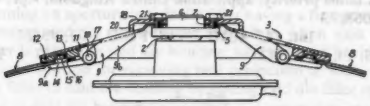
Jacques Eugene Bouet, Villeneuve-d'Ascq, France, assignor to International Harvester Company, Chicago, Ill.

Filed May 12, 1975, Ser. No. 576,830

Claims priority, application France, May 10, 1974, 74.16280

Int. Cl.² A01D *55/18*

U.S. Cl. 56—295 **10 Claims**



1. In a rotary type of mower having a rotor disc carrying a pair of diametrically positioned cutters on the underside of the disc, an improved cutter mounting, comprising:

a pair of rigid lever arms pivotally mounted symmetrically to the underside of the disc, each of the arms having an outboard end extending in a radial direction toward the periphery of the disc, and each of the outboard ends being swingable about the pivotal axis in a vertical plane;

a pair of shafts having two stepped diameters respectively mounted to the outboard end of the lever arms;

the cutters are a pair of elongated blades having a hole at one end of a diameter journalled fitting one step of the shafts and are respectively mounted thereon;

the one step of the shafts having a height larger than the thickness of the blades to provide a clearance between the underside of the disc and the blades;

the underside of the disc having a pair of round recesses aligned with the second step of the shafts and are of a

diameter to admit only the respective second step of the shafts; and

arm securing means carried on the disc for locking the outboard end of the arms against vertical swinging and for seating the second step of the shafts in the respective recesses and for abutting the one step about the periphery of the respective recesses and thereby for anchoring the blades to the disc.

3,958,403

OPEN-END SPINNING UNIT WITH FIBER GUIDE DISC

Rolf Wehling, Bremen, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Apr. 25, 1975, Ser. No. 571,629

Claims priority, application Germany, May 3, 1974, 2421415

Int. Cl.² D01H 1/12

U.S. Cl. 57—58.89 **10 Claims**

1. In an open-end spinning unit for producing yarn from fiber material, the unit including a spinning rotor member having a circumferential portion extending axially from one axial end face of the rotor to enclose a space in which such yarn is formed and which defines a fiber collection trough, and a fiber guide disc member rotatably mounted coaxially of the rotor member and having at least a portion disposed within such space, the improvement wherein said guide disc member is free of physical connection to any drive system and is mounted to be freely rotatable, and said unit comprises means establishing a force transmission between said rotor member and said disc member for causing the rotation of said rotor member to induce rotation of said disc member without physical contact between said rotor member and said disc member.

3,958,404

BALLOON CONTROL RING

Hiroyuki Kanai, No. 3-15, Matsunouchi-cho, Ashiya, Hyogo, Japan

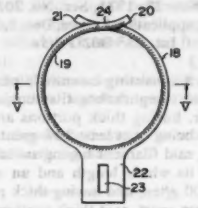
Division of Ser. No. 284,492, Aug. 29, 1972, Pat. No. 3,863,433. This application Dec. 11, 1974, Ser. No. 531,559

Claims priority, application Japan, Sept. 2, 1971, 46-67756; Oct. 7, 1971, 46-79029; May 16, 1972, 47-48305

Int. Cl.² B65H 57/22

U.S. Cl. 57—108 **4 Claims**

1. A balloon control ring through which a yarn is to pass having a ribbed inner surface over which the yarn rubs as it revolves and advances through the ring, the ribs on the inner surface being generally parallel to one another and extending at an angle of between 10° and 50° to the circular line at which the central plane in which the ring lies intersects the said inner surface, the arrangement being such that as a yarn revolves and passes over each successive rib, it engages each rib as or before it leaves the preceding rib, said ring being fixed to a supporting means through which it is fixed to the frame of a machine, said ring being a wire rod and said ribs being arranged on the inner surface of the rod proper to give such an inner surface like that of a stranded wire.



3,958,405

TEXTILE SPINDLE

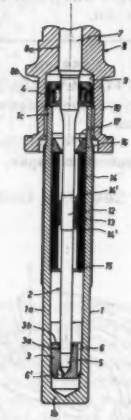
Dieter Widmer, Uster, Switzerland, assignor to Spindle-Motoren-und Maschinenfabrik A.G., Uster, Switzerland

Continuation of Ser. No. 374,155, June 27, 1973, abandoned. This application Mar. 6, 1975, Ser. No. 555,769

Claims priority, application Switzerland, July 10, 1972, 10291/72

Int. Cl.² D01H 7/12

U.S. Cl. 57—135 **4 Claims**



1. A textile spindle comprising a spindle housing, a spindle shaft having a free end, two bearings arranged in a space relationship from one another for mounting the spindle shaft in overhung fashion in the spindle housing, a whirl carried by the free end of the spindle shaft, a damping mechanism disposed within the spindle housing between the bearings at the region of maximum bending deflection of the spindle shaft, and means for retaining the damping mechanism against axial movement in the spindle housing, the damping mechanism comprising a spiral spring which is flexible in the radial direction with respect to the shaft and which is loosely introduced into the spindle housing and acts directly against the spindle shaft to damp bending deflection of the spindle shaft.

3,958,406

YARN HAVING A BASIS OF POLYESTER WITH IRREGULAR TITER

Claude Corbière, Riorges, France, assignor to Rhone-Poulenc-Textile, Paris, France

Filed Nov. 29, 1971, Ser. No. 203,064
Claims priority, application France, Dec. 1, 1970, 70.43429
Int. Cl.² D02G 3/34
U.S. Cl. 57—140 J 2 Claims

1. Polyester yarn consisting essentially of at least one oriented polybutylene terephthalate filament, said filament of irregular diameter, having thick portions and thin portions, the thick portions being of at least 20% greater diameter than the thin portions, said filament having substantially constant crystallinity over its whole length and an average Young's modulus below 300 g/tex, and having thick portions of about 1 to about 5 meters apart, said thick portions being of about 2 mm to about 150 cm long.

3,958,407

YARN TEXTURING

Martin Joseph Roden, and Frederick William Shaw, both of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 22, 1974, Ser. No. 500,004
Claims priority, application United Kingdom, Aug. 28, 1973, 40524/73
Int. Cl.² D01H 13/28
U.S. Cl. 57—157 TS 9 Claims

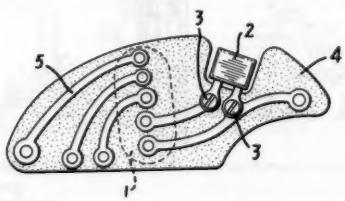
1. A yarn texturing process in which yarn advances from twist setting means to false twisting means wherein the improvement comprises passing the yarn through a continuous elongated slot in heat transfer means positioned between the twist setting and false twisting means where the yarn is cooled by a transverse fluid flow which also supports the yarn in a curved path within the slot.

3,958,408

CIRCUIT BLOCK FOR AN ELECTRONIC WATCH

Kazuo Nagasawa, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Nov. 14, 1974, Ser. No. 523,892
Claims priority, application Japan, Nov. 17, 1973, 48-132952[U]
Int. Cl.² G04C 3/00; G04B 27/00
U.S. Cl. 58—23 AC 4 Claims



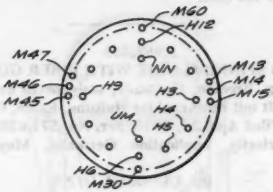
1. A circuit block for an electronic watch comprising; a printed circuit substrate; a timing module secured to said substrate comprising a time standard circuit having an oscillator, an oscillating circuit, a divider and a driving circuit; a regulating element interchangeably mounted on said substrate for regulating the period of the output signals from said timing module to a desired frequency, said regulating element comprising a capacitor having a capacity effective to regulate the period of said output signals to the desired frequency, an evacuated case containing said time standard circuit, and conductors on said printed circuit substrate connecting said regulating element to said timing module and including output conductors from said timing module.

3,958,409

WATCH DISPLAY

Solomon Manber, Hoffstats Lane, Sands Point, N.Y. 11050

Filed Sept. 12, 1974, Ser. No. 505,473
Int. Cl.² G04B 19/24, 19/06
U.S. Cl. 58—50 R 9 Claims



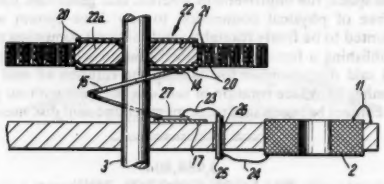
1. Display apparatus for use in a watch wherein an oscillator generates clock pulses which are counted down to signals representing minutes and signals representing hours, said display apparatus comprising a first series of diode means which emit light when energized for representing hours, a second series of diode means which emit light when energized, at least some of the diode means of said second series forming a set of diode means which represent different multiples of 5 minutes, energizing means connected to said oscillator for sequentially energizing the diode means of said first series for 1 hour intervals and for sequentially energizing the diode means of said set for 5 minute intervals, and means connected to said oscillator for pulsatingly energizing one of the diode means of one of said series to indicate the number of minutes in excess of a multiple of five being represented by the watch.

3,958,410

TERMINATION DEVICE FROM HAIRSPRING-HUB TO DRIVE COIL ON TWO CONDUCTOR HAIRSPRING

Harvey Maxwell Bell, Thorpe Lea, England, assignor to Timex Corporation, Waterbury, Conn.

Filed June 2, 1975, Ser. No. 583,349
Int. Cl.² G04B 17/06; G04C 3/04; H02K 33/02
U.S. Cl. 58—107 6 Claims



1. A termination arrangement for two conductor hairspring for coupling drive pulses to a balance wheel drive coil in an electric watch of the kind having a hairspring fastened at an inner end to a hub, a hairspring conductor being electrically insulated from the hub and electrically coupled to an end of a drive coil mounted on a balance wheel, wherein the improvement comprises.

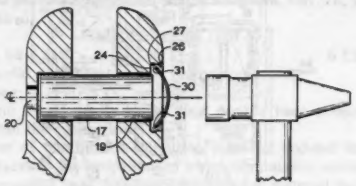
means forming an electrically conductive contact member for being affixed to said hub and electrically insulated from said hub and electrically connected to said hairspring conductor;

a spring-conductor means being affixed to said balance wheel and electrically insulated from said balance wheel and electrically connected to said drive coil for providing electrical contact by spring pressure with at least said contact member.

3,958,411
SHACKLE

Jorgen O. Bernt, 1357 Amber Crescent, Oakville, Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 492,432, July 29, 1974, abandoned. This application Dec. 3, 1974, Ser. No. 529,048
Int. Cl.² F16G 15/06
U.S. Cl. 59—86 10 Claims



1. Shackle comprising an extent of metal shaped to form a bight and provided with two arms extending from said bight and having adjacent free ends; spaced to allow the passage therebetween of a member to be coupled to said shackle,

said two arms being shaped to provide aligned bores,

whereby a shackle pin may be slid into said bores, entering initially through the bore in one of said arms,

a shackle pin designed to be longitudinally slid into said bores and to be rotatable therein about its longitudinal axis,

means for stopping the travel of said shackle pin into said bores when said pin is resting in both bores and extending between said arms,

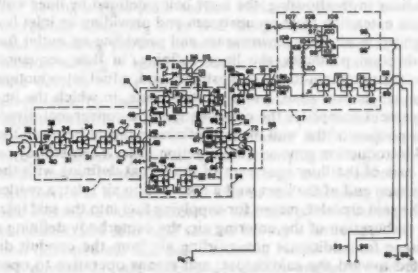
the bore in said one arm being formed with an enlarged opening at the end thereof remote from the other arm, said opening being provided with a transverse dimension increasing inwardly from the end thereof to form an undercut recess just inwardly from the end thereof, which is a surface of revolution about the said bore in said one arm,

said one shackle arm and said pin being designed so that when said pin is resting as stopped by said stopping means, the two ends of a curved retainer inserted into said opening and concavely facing it will, when said retainer is straightened be guided into opposed portions of said undercut recess.

3,958,412
FLUIDIC GAS TURBINE FUEL CONTROL

Gary L. Frederick, Tempe, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Feb. 25, 1974, Ser. No. 445,763
Int. Cl.² F02C 9/10
U.S. Cl. 60—39.03 13 Claims



12. A method of controlling the fuel flow to a gas turbine engine having a rotating compressor comprising the steps of:

measuring the speed of rotation of said engine;

generating a first fluidic signal for controlling said speed in the steady state operating condition of the engine;

generating a second fluidic signal for controlling said speed during acceleration of said engine speed;

generating a third fluidic signal representative of the compressor discharge pressure of said compressor;

measuring the difference between said first signal and said second signal;

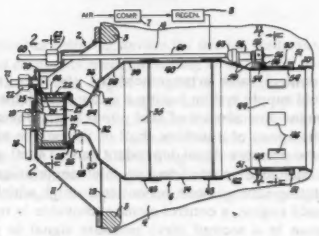
multiplying the difference between said first and second signals by said third signal to generate a fourth fluidic signal; and

controlling fuel flow to said engine in accordance with the value of said fourth signal.

3,958,413
COMBUSTION METHOD AND APPARATUS

Walter Cornelius, Troy, and Hans P. Fredriksen, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 3, 1974, Ser. No. 502,754
Int. Cl.² F02C 7/26, 9/14
U.S. Cl. 60—39.06 8 Claims



1. A method of generating combustion products for operating a gas turbine comprising compressing air, heating the air, flowing a portion of the heated compressed air as primary air into a prechamber, supplying fuel to the prechamber, mixing the fuel and primary air and varporizing the fuel in the prechamber, discharging the air-fuel mixture through a throat into a reaction chamber, burning the fuel in the reaction chamber, flowing the remainder of the heated compressed air as secondary air, mixing the secondary air with the combustion products flowing from the reaction chamber, controlling the relative proportions of primary and secondary air so as to maintain a constantly lean ratio of fuel to primary air over the operating regime, and concurrently controlling the swirl of the primary air entering into the prechamber so as to insure vaporization and homogeneous mixing of the fuel with the air, imparting substantial swirl to the primary air during start-up of combustion sufficient to promote recirculation from the reaction chamber into the prechamber to stabilize combustion, and imparting sufficiently slight swirl to the primary air throughout the operating regime to insure the expulsion of flame from the prechamber and complete combustion of the lean fuel-air mixture in the reaction zone to minimize undesired components in the resulting combustion products.

3,958,414

CONTROL VALVE ARRANGEMENT FOR GAS TURBINE ENGINE FUEL SUPPLY SYSTEM

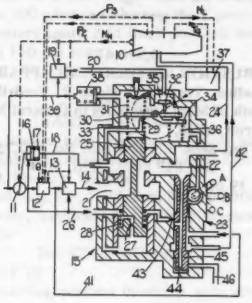
Trevor Stanley Smith, Sutton Coldfield, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Nov. 6, 1974, Ser. No. 521,207

Claims priority, application United Kingdom, Nov. 15, 1973, 53029/73; Jan. 26, 1974, 3748/74

Int. Cl.² F02C 9/08

U.S. Cl. 60—39.28 R 15 Claims



1. A control valve arrangement for use in a gas turbine engine fuel supply system having a pump, a variable metering arrangement downstream of said pump and a device responsive to the speed of a turbine shaft of the engine to generate a first servo pressure signal dependent on said shaft speed, said valve arrangement comprising an inlet communicating with said metering arrangement, an outlet through which fuel can flow to said engine, a control element movable in response to an increase in a second servo pressure signal to permit an increased flow through said outlet, a pilot valve having a control member responsive to an increase in said first servo pressure signal to decrease said second servo pressure signal, means for biasing said pilot valve control member against said first servo pressure signal, and means, responsive to an increase in an engine operating parameter, for reducing the force applied to said pilot valve control member by said biasing means.

3,958,415

FUEL CONTROL SYSTEM FOR GAS TURBINE ENGINE

Geoffrey Arthur Lewis, Solihull, England, assignor to Lucas Aerospace Limited, Birmingham, England

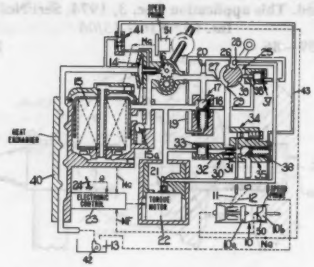
Filed Aug. 21, 1974, Ser. No. 499,112

Claims priority, application United Kingdom, Sept. 6, 1973, 41883/73

Int. Cl.² F02C 9/10

U.S. Cl. 60—39.28 R 7 Claims

1. a fuel control system for a gas turbine engine, which includes a gas generator turbine and a separate work turbine, comprising a positive-displacement pump driven, in use, by the engine, a spill valve responsive to a servo pressure signal to spill fuel from the downstream side of said pump, a pilot valve responsive to a first electrical signal to control said servo pressure signal, a flow restrictor in series with said pilot valve between the downstream side of said pump and a low pressure zone, said servo pressure signal being derived from the pressure intermediate said restrictor and said pilot valve, means for generating said first electrical signal in response to engine operating parameters, means for isolating said pilot valve from said restrictor and a further valve in parallel with said pilot



valve, said further valve being responsive to operation of said isolating means to control said servo pressure signal.

3,958,416

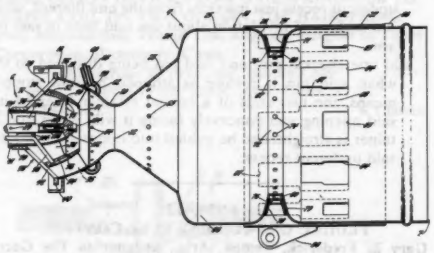
COMBUSTION APPARATUS

Dean C. Hammond, Jr., Warren, Mich., and Ronald E. Quinn, Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1974, Ser. No. 531,873

Int. Cl.² F02C 7/22; F02M 23/08

U.S. Cl. 60—39.65 4 Claims



1. A combustion apparatus comprising, in combination, a housing providing a conduit for compressed air and a combustion liner in the housing, the liner being defined by liner wall means extending from an upstream end providing an inlet for combustion air to a downstream end providing an outlet for combustion products; the liner defining, in flow sequence from the upstream to the downstream end, a fuel introduction zone, a reaction zone, and a dilution zone, in which the improvement comprises the combination of a convergent-divergent portion of the wall means defining a throat between the fuel introduction zone and the reaction zone; a centerbody on the axis of the liner upstream of the throat defining with the upstream end of the liner wall a combustion air inlet; a swirler in the said air inlet; means for supplying fuel into the said inlet for carburetion of the entering air; the centerbody defining a passage for additional non-swirling air from the conduit directed toward the said throat; and means operative to open and close the said passage, the last-named means including means to close the passage only at low rates of fuel introduction.

3,958,417
SUPPRESSION OF UNSTABLE BURNING IN ROCKET MOTORS

Stuart Gordon, Cleobury Mortimer; Geoffrey Ian Evans, Bewdley; Philip Graham Jones, Kidderminster, and Stephen William Bell, Thaydon Bois, all of England, assignors to Imperial Metal Industries (Kynoch) Limited, England

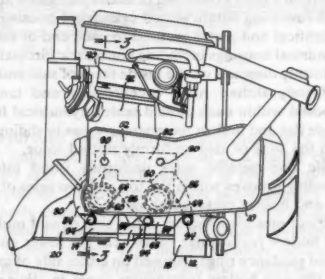
Filed Nov. 14, 1967, Ser. No. 683,764
Claims priority, application United Kingdom, Nov. 16, 1966, 51411/66
Int. Cl.² F23R 1/18
U.S. Cl. 60—219 6 Claims

1. A solid propellant rocket motor comprising:
a casing;
a nitric ester nitrocellulose cast double base propellant within the casing; and
a layer of combustion-inhibition material bonded to the surfaces of the propellant of which combustion inhibition is required, said combustion-inhibition material being a self-supporting silicone elastomer, at least part of said layer of combustion-inhibition material being exposed for at least partial burning during combustion of the propellant, said elastomer being present in an amount in excess of the amount combusted during combustion of the propellant.

3,958,418
CLAMP ARRANGEMENT

Walter C. Heidacker, Bloomfield Hills, and Paul H. Nagel, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 3, 1974, Ser. No. 502,539
Int. Cl.² F01N 7/10
U.S. Cl. 60—323 4 Claims

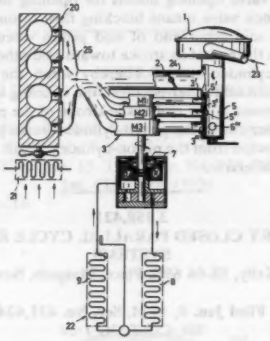


1. A first device, a second device having an outwardly extending portion with a flange for securing said second device to said first device in an installed position, a clamp member having a rigid plate section and a flexible arm extending therefrom extending over said flange and about one side of said extending portion of said second device, said rigid plate section having a spherical socket that is locatable between said devices in the installed position of said second device, pivot-securing means for pivotally securing said rigid section adjacent said arm to said first device to permit said flange of said second device to be slipped under said clamp member into the installed position, a bolt extending through a hole in both the end of said arm and said flange and threaded to said first device in a location on a side of said extending portion of said second device opposite the side said pivot-securing means is located, and said rigid section having a force applying portion intermediate said pivot-securing means and said extending portion of said second device for engaging said flange between said extending portion and said pivot-securing means prior to said bolt tightly clamping said arm and said flange to said first device whereby said arm flexes as said bolt is tightened and there is applied clamping load on said flange on opposite sides of said extending portion.

3,958,419
DRIVE ENGINE FOR MOTOR CAR ACCESSORY UNITS

Nikolaus Laing, Hofener Weg 35 bis 37, 7141 Aldingen near Stuttgart, Germany

Filed Nov. 26, 1973, Ser. No. 419,211
Claims priority, application Austria, Nov. 28, 1972, 101109/72
Int. Cl.² F15B 11/18
U.S. Cl. 60—397 7 Claims

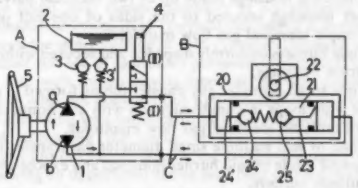


1. An auxiliary driving device for driving units auxiliary to an internal combustion engine having an induction duct, comprising an expansion engine located in the induction duct of said internal combustion engine and driven by air passing through said induction duct whereby said expansion engine acts as a throttling device in said induction duct, and at least one bypass duct having a throttling device therein which duct bypasses said expansion engine whereby air may enter into the internal combustion engine when said expansion engine is not operating.

3,958,420
AIR EXTRACTING SYSTEM FOR HYDRAULIC STEERING APPARATUS

Nobutoshi Yokota, Kobe, Japan, assignor to OHJI Seiki Kogyo Kabushiki Kaisha, Kobe, Japan

Filed Apr. 16, 1975, Ser. No. 568,584
Claims priority, application Japan, Oct. 16, 1974, 49-124660[U]
Int. Cl.² F15B 21/04
U.S. Cl. 60—453 2 Claims



1. In a hydraulic steering apparatus having a pump means for pumping hydraulic fluid in response to the operation of a steering wheel, a piston-cylinder means having a piston moved in opposite directions and coupled to a steering mechanism for actuating the steering mechanism when the piston is moved, the piston-cylinder means being hydraulically coupled

to the pump means, and a reservoir coupled to said pump means,

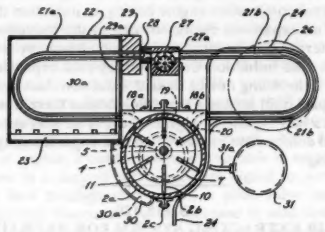
the improvement comprising an air extracting system comprised of a changeover valve coupled between the pump means and the piston-cylinder means for coupling the pump means and the piston-cylinder means in a closed hydraulic circuit when the changeover valve is in one position, and for coupling the pump means to one end of the piston-cylinder means and coupling the other end of the piston-cylinder means to the reservoir when the changeover valve is in the other position, said piston having a bore therethrough from end to end, and two way check valve means in said bore, said check valve means having valve opening means for opening the portion of said check valve means blocking flow through said bore toward said other end of said piston when said piston reaches the end of its stroke toward said other end of said piston-cylinder means, whereby when the changeover valve is in said other position, the opening of said check valve means at the end of the stroke of the piston toward said other end of the piston-cylinder means permits air to be extracted from the piston-cylinder means and directed to the reservoir.

3,958,421

ROTARY CLOSED PARALLEL CYCLE ENGINE SYSTEMS

Donald A. Kelly, 58-06 69th Place, Maspeth, New York, N.Y. 11378

Filed Jan. 8, 1974, Ser. No. 431,624
Int. Cl.² F02G 1/04
U.S. Cl. 60—517 **4 Claims**



1. A rotary closed parallel cycle engine system comprising multiple identical rotary units consisting of rotors and vanes revolving within split cylindrical housings made up of two identical halves,

multiple identical gas flow manifolds secured at the sides of said split cylindrical housings,

multiple port means disposed at the upper sides of said split cylindrical housings made up of two identical halves,

burner housings secured to the sides of one-half of said multiple identical gas flow manifolds,

multiple burners uniformly disposed and secured within said burner housings,

multiple small diameter gas transfer tubing formed in multiple wide loops in communication with and connected to said multiple identical gas flow manifolds,

one-half of said multiple small diameter gas transfer tubing located inside of said burner housings and exposed to said multiple burners,

one-half of said multiple small diameter gas transfer tubing in tangent contact with multiple liquid coolant tubing circuits from a liquid cooling source,

one-half of said multiple small diameter gas transfer tubing in tangent contact with multiple liquid coolant tubing is made up of equal sections of uniformly increasing diameter from the multiple identical gas flow manifolds to the upper center of said multiple identical rotary units,

multiple low-inertia rotary gas pumps disposed over the exact center of said multiple identical rotary units,

one-half of said multiple small diameter gas transfer tubing is connected to one side of said low-inertia rotary pumps,

one-half of opposite said multiple small diameter gas transfer tubing is connected to the other side of said low inertia rotary pumps,

insulated bushings securing said multiple small diameter gas transfer tubing to both sides of said low inertia rotary pumps,

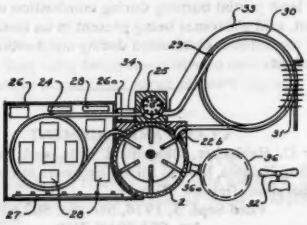
gas pressure snubbing means secured to one side of said low-inertia rotary gas pumps.

3,958,422

ROTARY STIRLING CYCLE ENGINE SYSTEMS

Donald A. Kelly, 58-06 69th Place, Maspeth, N.Y. 11378

Filed Oct. 24, 1974, Ser. No. 517,507
Int. Cl.² F02G 1/04
U.S. Cl. 60—525 **10 Claims**



1. A rotary Stirling cycle engine system comprising multiple identical rotary units consisting of eccentric rotors and multiple vanes revolving within sealed cylindrical housings,

two identical end plates secured to each end of said sealed cylindrical housings including concentric circular grooves uniformly disposed on the inside faces of said end plates,

a uniformly slotted rotor eccentrically and tangentially disposed within each of said sealed cylindrical housings,

multiple flat and hollow rectangular vanes in sliding contact with the slots of said uniformly slotted rotor,

multiple non-metallic seals uniformly fitted into corresponding grooves within the top and two sides of multiple flat and hollow rectangular vanes,

cylindrical pins disposed on either side of said multiple flat and hollow rectangular vanes near the lower end,

grooved guidance rings disposed on either side of said multiple flat and hollow rectangular vanes in sliding contact with all of said cylindrical pins,

two low-friction discs disposed on either side of said uniformly slotted rotor between said two identical end plates,

a drive shaft concentrically disposed through said uniformly slotted rotor supported by two bearings eccentrically disposed within each of said two identical end plates,

multiple gas pressure seals disposed on the inner and outer faces of each of said two identical end plates and over said drive shaft,

a hot gas manifold and cold gas manifold secured at the upper opposite sides of each of said sealed cylindrical housings,

multiple gas transfer ports disposed at the upper sides of said sealed cylindrical housings in direct communication with said hot and cold gas manifolds,

a small high speed rotary return pump disposed directly above said sealed cylindrical housings with drive shaft connection means to said drive shaft,

multiple small diameter tubing loops in parallel groups disposed between said hot gas manifolds and said rotary return pump nearly laterally in line with said sealed cylindrical housings,

a burner housing disposed over the complete groups of said multiple small diameter tubing loops,

multiple burners uniformly located at the base of said burner housing,

multiple small diameter tubing loops in several lateral-series gas flow paths disposed between said cold gas manifold and said rotary return pump above said sealed cylindrical housings,

multiple outer mounting brackets secured to the outer surface and ends of said sealed cylindrical housings,

multiple spacers disposed adjacent to said multiple outer mounting brackets secured by multiple mounting hardware,

standard fastening and sealing means utilized for joining and sealing of components of said rotary Stirling cycle engine system.

3,958,423

HYDRAULIC BRAKE BOOSTER

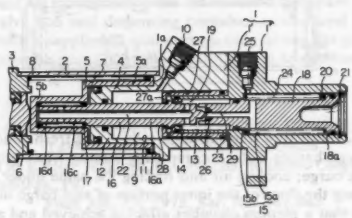
Yoshihiro Hayashida, Chigasaki; Tetsuo Haraikawa, Funabashi, and Setsuo Mitobe, Kawasaki, all of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed July 29, 1974, Ser. No. 492,934

Claims priority, application Japan, Aug. 9, 1973, 48-89444; Feb. 20, 1974, 49-20242; Mar. 7, 1974, 49-26566; Apr. 12, 1974, 49-41146

Int. Cl.² B60T *13/20*

U.S. Cl. 60—553 **6 Claims**



1. A hydraulic braking force multiplying device for motor vehicles, comprising a body coupled to a master cylinder, a portion on said body which projects in the direction of said master cylinder, a cup-shaped power piston slidably mounted on said body coaxially with the master cylinder and engaged with the piston of said master cylinder, said cup-shaped piston when it moves toward said master cylinder defining therewithin and with said projecting portion a working chamber, said body having a pressure chamber therein having means for placing said pressure chamber in communication with a source of pressurized fluid, said body having a bore therein on the end remote from said projecting portion and opening into said pressure chamber, an input shaft slidable in said bore in the direction of movement of said cup-shaped power piston on said projecting portion, said input shaft having a drain bore therethrough in communication with a drain to a fluid reservoir, a valve stem member extending through said projecting portion from said cup-shaped power piston and through said pressure chamber to adjacent the end of said input shaft and being movable into and out of said working chamber, said valve stem member having a bore therethrough opening into said working chamber and having an opening at the other end thereof adjacent said input shaft, a first valve seat means on said body and with which said valve stem member is engagable to form a first valve for placing said working chamber and said pressure chamber in communication when said first valve is open, the end of said input shaft toward said pressure chamber and the end of said valve stem member toward said input shaft having valve member means and a second valve seat means thereon cooperating to form a second valve for placing said working chamber and said drain bore in communication when said second valve is open, one of said second valve seat means and said valve member means being resilient for causing both said first and second valves to be closed during the first part of the stroke of said input shaft toward said valve stem member, whereby when there is no pressure in said pressure chamber, the power piston will be moved directly by the movement of the input shaft engaging the valve stem member which in turn engages the cup-shaped power piston, and a stop slidingly extending into said pressure chamber in the direction of movement of said valve stem member and normally held against sliding movement by the pressure fluid in said pressure chamber and having a portion thereon engaged by said valve stem member after a limited movement of said valve stem member for limiting the movement of said input shaft.

3,958,424

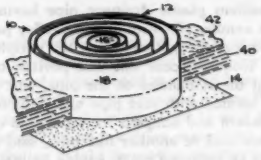
LIQUID LIFTING AND STORAGE APPARATUS AND METHOD

Boyce Y. Cotton, Sanford, N.C., assignor to Horace P. Cotton, Roanoke, Va.

Filed Jan. 15, 1974, Ser. No. 433,470

Int. Cl.² E02B *13/00*

U.S. Cl. 61—10 **3 Claims**



1. A liquid lifting and storing system for irrigation purposes comprising a base support member embedded in the earth and having an upper surface below the soil level of its immediate surroundings and a liquid lifting and storing unit having a lower end resting upon said upper surface of said base support member, said lifting and storing unit including a vertically extending axial cylindrical central core having an outer surface, an outer peripheral cylinder member having an inner surface coaxially positioned with respect to said central core and a spiral web means extending in equidistantly spaced continuous uninterrupted convolutions about a vertical axis between the outer surface of said cylindrical central core and the inner surface of said outer peripheral cylindrical member with said web means having opposite surfaces facing each other in adjacent convolutions to define closely spaced vertically extending wall surfaces to provide a capillary action on liquid occupying the space between said wall surfaces, whereby ground water surrounding said base support member and having an upper level above the upper surface of said base support member seepingly moves between the lower end of said lifting and storing unit over the upper surface of said base member to occupy the space between the lower portions of said opposite surfaces of said web means and said capillary action lifts said water above the upper level of the ground water with water in said lifting and storing unit being released to flow in a reverse direction back into the surrounding earth as the upper level of the ground water falls.

3,958,425
CORRUGATED PLASTIC DRAINAGE PIPE WITH INTEGRAL COUPLER

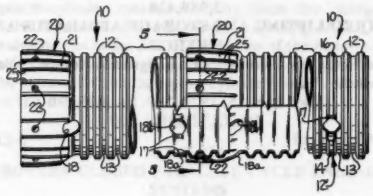
Ernest J. Maroschak, Roseboro, N.C., assignor to Plastic Tubing, Inc., Roseboro, N.C.

Continuation-in-part of Ser. No. 228,508, Feb. 23, 1972, Pat. No. 3,802,202, and a continuation-in-part of Ser. No. 254,934, May 19, 1972, and a continuation-in-part of Ser. No. 352,245, April 18, 1973. This application Dec. 5, 1973, Ser. No. 421,977

The portion of the term of this patent subsequent to July 29, 1992, has been disclaimed.

Int. Cl.² F16L *31/00*, *47/00*

U.S. Cl. 61—11 **18 Claims**



1. A resilient plastic drainage pipe having spaced apart successive annular ribs with annular valley portions therebetween defining corrugations along the periphery of the pipe extending from adjacent one end portion of the pipe and throughout the remainder of the pipe, and coupling means integrally formed with said pipe and defining said one end portion thereof and adapted for releasable connection with the opposite end of another like pipe, said coupling means comprising an enlarged collar having an inner diameter and length so as to receive therein at least one rib at the end of a connecting pipe, the wall thickness of the collar being thinner at the outer end thereof than at the inner end so as to provide additional flexibility in the outer portion of the collar, said collar also having a plurality of spaced latching members integrally formed with and extending radially inwardly from the outer, more flexible portion of said collar, with the radial distance from the inner end of each latching member to the axis of the collar being less than the radius of said ribs, said latching members thereby being outwardly displaceable with respect to one another for facilitating inserting the end of a corrugated pipe within the collar and being resiliently returnable for engaging the ribs of the corrugated pipe and providing a releasable connection therewith.

3,958,426
OFFSHORE HARBOR TANK AND INSTALLATION

Sigurd Helen, Aslokkveien 82, Billingstad, 1370 Asker, Norway

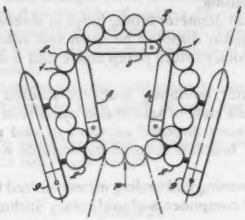
Filed Feb. 16, 1972, Ser. No. 226,684

Claims priority, application Norway, Mar. 2, 1971, 768/71

Int. Cl.² E02D *7/00*

U.S. Cl. 61—46 **5 Claims**

1. An offshore harbor and tank installation for oil and gas, comprising a plurality of closed containers comprising cylindrical hollow sections in the form of caissons having end walls, means detachably interconnecting said caissons in axially aligned relationship, means detachably interconnecting a plurality of axially aligned series of caissons in upright side-by-side relationship, and means ballasting said axially aligned series of caissons so that they rest on the sea floor and extend well above the surface of the sea, the upper sections of the caissons being removed in a limited area of the breakwater in order to make room for a ship entrance, the breakwater heads at the entrance being strengthened by means of extra caissons



which rest against and are connected to a submerged threshold in the entrance.

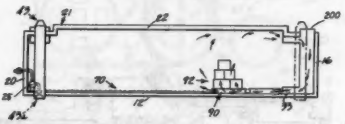
3,958,427
FRESH PRODUCE BARGE

Eric Rath, La Jolla, Calif., and George C. Mauder, Jr., Brooklyn, N.Y., assignors to Frigitemp, New York, N.Y.

Filed Apr. 13, 1972, Ser. No. 243,695

Int. Cl.² F25D *17/06*

U.S. Cl. 62—62 **7 Claims**



1. The method of transporting produce in a fresh condition in a barge having a deck comprising storing fresh produce within a barge; cooling air and forcing the same under pressure along the floor of the inner portion of said barge in such manner that a plenum chamber effect is achieved and a portion of such air circulates upward throughout the entire length of said barge; and drawing the air so circulated through said barge along the lower side of the deck of said barge back to said air conditioning unit for further cooling and recirculation.

3,958,428
METHOD AND APPARATUS FOR MAKING FROZEN FOOD ARTICLE

James W. Kelso, Pacific Palisades, Calif., assignor to Joseph M. Yuhasz and Sean A. O'Brien, both of Canoga Park, Calif.

Continuation-in-part of Ser. No. 282,913, Aug. 23, 1972, abandoned. This application Aug. 9, 1974, Ser. No. 496,009

Int. Cl.² A23G *9/00*; F25D *3/00*

U.S. Cl. 62—69 **13 Claims**

1. An apparatus for intermittently operating a dispensing container at below freezing temperatures comprising, in combination:

a reservoir;

a chilled coolant fluid normally contained in said reservoir;

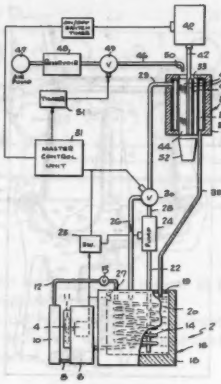
conventional refrigeration means in heat exchange relationship with said coolant fluid for maintaining said coolant fluid at a first temperature substantially below the freezing point of water;

a dispensing container remote from said reservoir for intermittently receiving and dispensing a water-containing substance, said container being provided with a circulant coolant passage, said passage having a volumetric capacity substantially less than the quantity of coolant fluid in said reservoir;

conduit means in communication between said reservoir and said passage for conveying said coolant fluid therebetween, said conduit means including pump means, and

selectively operably valve means to commence and terminate flow of coolant fluid to said passage;

selectively operable means for intermittently providing said remote dispensing container with said water-containing substance, and dispensing such substance from said container after cooling thereof; and



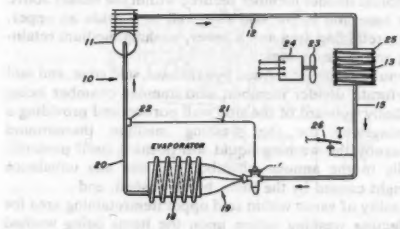
means for coordinating the intermittent operation of said valve and said dispensing container so that said coolant fluid is supplied to said passage only during the period of time the water-containing substance is in said container.

3,958,429

AIR-COOLED CONDENSER PRESSURE CONTROL AT LOW AMBIENT TEMPERATURES

Ralph R. Kirsch, Wexford, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Jan. 17, 1975, Ser. No. 541,863
Int. Cl.² F25B *39/04*
U.S. Cl. 62—184 **3 Claims**



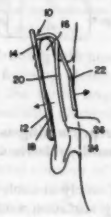
1. In a refrigeration system comprising a compressor, an air-cooled condenser having a liquid line, a refrigerant metering means and an evaporator, all of which are connected in series, including improved means for maintaining adequate high-side pressure in the system at low outdoor ambient temperatures to assure an adequate mass flow rate of refrigerant through the refrigerant metering means, the improvement comprising means for controlling the volume of ambient air flowing across the condenser in response to fluctuations in high-side pressure, said air flow controlling means comprising a fan arranged to direct a flow of ambient air across the condenser, drive means in operative engagement with said fan, said drive means being capable of rotating the fan in two directions, pressure sensing means located on the liquid line of the condenser, said pressure sensing means being in operative communication with said drive means such that the fan will rotate in one direction when the high-side pressure, as sensed by said pressure sensing means, is at or above a predetermined level to thereby direct the flow of ambient air across the condenser in the conventional direction, and such that the fan will rotate in the other direction when the high-side pressure drops below said predetermined level, as sensed by said pressure sensing means, to thereby counteract the flow of ambient air thus diminishing the volume of ambient air flowing across the condenser.

3,958,430

ORNAMENTAL EAR CLIP WITH RETAINING MEANS PRESSING AGAINST THE EAR AND HEAD

Margaret Barron, Bronxville, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed June 18, 1975, Ser. No. 588,040
Int. Cl.² A44C *7/00*
U.S. Cl. 63—14 A **2 Claims**



1. An ornamental earclip device for attaching against the front face of an external ear of a wearer comprising a decorative member sized and proportioned to extend from the top of the helix to the lobe of the ear in a position resting flatwise on said front face, mounting means attached to said decorative member for holding it in said position comprising a first leg extending from the top of said decorative member for extending over the top of the helix and down along the rear side of the ear, said first leg being bent to conform to the rear side of the antihelix of the ear and a second leg extending from the top of said decorative member for extending over the top of the helix and down along the intersection of said ear with the back side of the head, said legs being arranged to press respectively against the ear and head to support the earclip in said position on the wearer's ear.

3,958,431

UNIVERSAL JOINT AND METHOD FOR MAKING THE SAME

Rodger L. Moring, Yorkville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 19, 1974, Ser. No. 462,379
Int. Cl.² F16D *3/26*
U.S. Cl. 64—17 A **4 Claims**

1. A universal joint adapted to connect an input shaft to an output shaft comprising

first and second yoke assemblies each having a pair of spaced support arms,

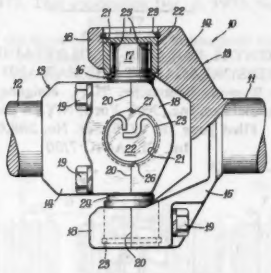
a journal cross, having four cylindrical journals extending radially outwardly therefrom, universally interconnecting said first and second yoke assemblies together,

mounting means rotatably mounting each one of said journals on a respective one of said support arms comprising fastening means releasably attaching an end cap on a free end of said support arm at abutting and co-planar and flat bearing surfaces thereof, means defining a substantially uninterrupted cylindrical bore of uniform diameter formed completely through and between said end cap and said support arm and a cylindrical bearing race closely fitted within said bore and rotatably mounting said journal therein, said bearing race being cup shaped to dispose

a closed outer end thereof on a free end of a respective journal and an open inner end thereof adjacent to the other one of said first and second yoke assemblies,

retaining means comprising a snap ring operatively engaged between the outer end of said bearing race and a respective support arm for preventing said bearing race from moving radially outwardly relative to a respective journal, and

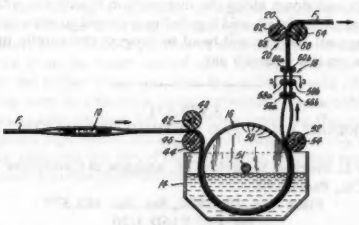
means forming a relief solely at each radially inner edge of each of said bearing surfaces, said relief extending the entire axial length of a respective bore.



3,958,432
APPARATUS FOR TREATING TUBULAR FABRICS

Edward I. Aronoff, 605 Dorais St., St. Laurent, Quebec, Canada

Filed Feb. 25, 1974, Ser. No. 445,563
Int. Cl.² D06B 23/02
U.S. Cl. 68—13 R **5 Claims**



1. An apparatus for continuously treating tubular fabric when in a wet condition and which fabric tends to balloon when emerging from a liquid treatment bath, comprising

means for advancing tubular fabric upwardly from a liquid treatment bath along a predetermined substantially vertical planar path;

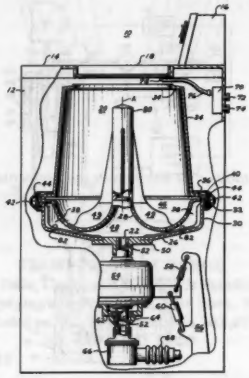
means along said path tending to form a balloon in the tubular fabric as it emerges from the liquid bath; and

a plurality of vertically spaced apart pairs of opposed fabric contacting means with each pair having a surface on respective opposite sides of the planar path, the opposed surfaces on each pair being spaced apart a distance greater than the thickness of the tubular fabric being treated but less than a distance out of contact with the tubular fabric thereby to reduce ballooning in the fabric and to knead the tubular fabric.

3,958,433
WASH BASKET FOR A WASHING MACHINE

John Bochan, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed June 20, 1974, Ser. No. 481,209
Int. Cl.² D06F 23/04, 39/08
U.S. Cl. 68—23.3 **6 Claims**



1. In a vertical axis washing machine, a combination tub-wash basket for receiving both items to be washed and a washing medium, and means for alternatively providing oscillatory motion and rotatable motion of the basket continuously in one direction for successive revolutions about its vertical axis, said basket comprising:

a generally circular, imperforate, concave base having a drain opening at the center thereof;

a generally annular, upturned edge extending upwardly from said base;

a generally cylindrical, imperforate side wall portion located above said base and said edge;

a perforate divider member secured within the basket above the base and below said side wall to provide an upper, item-retaining area and a lower, washing medium retaining and draining area;

an annular chamber formed by said base, said edge, and said perforate divider member, said annular chamber being radially outward of the side wall portion and providing a passageway for the washing medium therearound whereby the washing liquid will position itself postcritically in the annular chamber opposite any unbalance weight caused by the items being washed; and

a plurality of vanes within said upper itemretaining area for effecting washing action upon the items being washed during oscillatory motion of the basket.

3,958,434
WASHING MACHINE

Peter Grunbaum, Graz, Austria, assignor to Binder and Co., Aktiengeselischaft, Gleisdorf, Austria

Filed Aug. 1, 1974, Ser. No. 493,694
Claims priority, application Austria, Aug. 2, 1973, 6788/73
Int. Cl.² D06F 27/00, 31/00, 37/30
U.S. Cl. 68—27 **7 Claims**

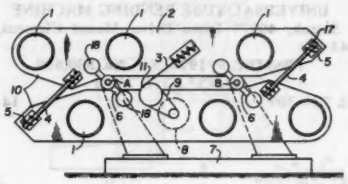
1. A washing machine comprising

1. a support,

2. two masses carried by the support and arranged to oscillate thereon in opposite directions,

a. each of the oscillating masses comprising a frame and a plurality of tubular wash receptacles mounted on the frame for oscillation therewith,

3. means for carrying the two masses on the support,
4. resilient means interconnecting the two masses,
   a. the two masses and the interconnecting resilient means constituting an oscillating system,



5. a drive for oscillating the system in the range of the natural frequency thereof,
6. means for delivering wash to the receptacle, and
7. pipes for delivering washing liquid leading into each of the receptacles

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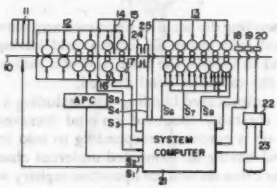
3,958,435
METHOD FOR CONTROLLING THE PROFILE OF WORKPIECES ON ROLLING MILLS

Yoshio Inoi; Takeyuki Fukuda; Kouji Hyoudou, all of Sakai, and Atsuhiro Wakako, Handa, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 28, 1975, Ser. No. 581,655
Claims priority, application Japan, June 1, 1974, 49-62289
Int. Cl.² B21B *37/00, 37/02, 37/10*
U.S. Cl. 72—9 5 Claims

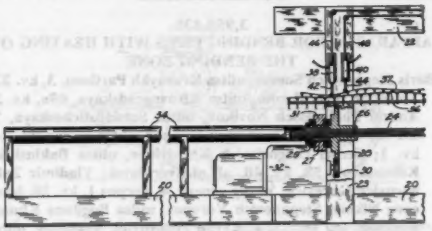


1. A method of controlling the profile of a workpiece passing through a rolling mill having a first roughing stage and second finishing stage comprising: establishing, with respect to the second finishing stage, a crown model formula including variables which correspond to a workpiece thickness at the outlet position of the first roughing stage, and a mean workpiece temperature in the second finishing stage; giving to said crown model formula a target crown value with regard to the workpiece being ejected from the second finishing stage, thereby obtaining relationship between the mean workpiece temperature and the workpiece thickness of the workpiece at the outlet position of the first roughing stage to attain said target crown value; obtaining a workpiece targer temperature at the inlet position of the second finishing stage from the mean workpiece temperature calculated out from the crown model formula; and controlling the workpiece temperature at the inlet position of the second finishing stage to said target temperature obtained in the preceding step.

3,958,436
DYNAMICALLY CONTROLLED FORMING BY DRAWING MACHINE

Frohman Anderson, 2386 Pleasant St., Dighton, Mass. 02135

Filed June 30, 1972, Ser. No. 268,195
Int. Cl.² B21D *5/06*
U.S. Cl. 72—17 6 Claims

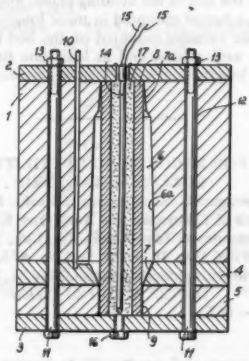


1. A forming by drawing machine comprising first, second and third stages of forming elements, means for drawing a metal sheet through the three stages, said first stage having opposing and intermeshing elements adapted to apply a restraining force to a sheet being drawn through said forming machine, means dependent on the changing transverse physical dimensions or lateral contour of said sheet during its travel being provided for dynamically and electronically raising and lowering together the opposing elements of said first stage, additional means independent of the physical dimensions and travel of said sheet for dynamically and electronically controlling the horizontal positioning of said elements in a predetermined manner.

3,958,437
PROCESS FOR MANUFACTURING METAL POLES

Seew Barorian, reh. Ovadia, 6, Haifa, Israel

Filed Jan. 24, 1975, Ser. No. 543,940
Int. Cl.² B21D *26/08*
U.S. Cl. 72—55 1 Claim



1. A method for manufacturing metal poles, particularly public illumination poles, including the steps of shaping a mold cavity according to an outer configuration suitable for forming at least a pole segment, arranging a tubular metal element in said mold cavity, introducing inside said tubular element an explosive material and detonating said explosive material so as to deform by explosion said tubular element whereby it assumes the configuration of said shaped cavity, wherein said tubular element is arranged with its lower end fittingly received in an aperture of the mold and with its remaining length freely extending in a mold cavity axially aligned with said aperture; said cavity being shaped so as to

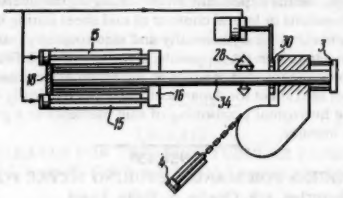
define a main portion of prevalent length and a minor intermediate portion between said main portion and said aperture, said tubular element having an axial development greater than that of the pole to be obtained; and wherein a finishing step is provided, which comprises cutting away from the deformed tubular element a portion corresponding to said intermediate /portion of the mold portion and to said aperture of the mold.

3,958,438

APPARATUS FOR BENDING PIPES WITH HEATING OF THE BENDING ZONE

Boris Stepanovich Somov, ulitsa Krasnykh Partizan, 3, kv. 22; Alexandr Ilich Mamin, ulitsa Kirovogradskaya, 69a, kv. 5; Andrei Porfirievich Novikov, ulitsa Sotsialisticheskaya, 7, kv. 13; Vyacheslav Ivanovich Filippov, ulitsa Polzunova, 24, kv. 1; Sergei Grigorievich Khirdzhiev, ulitsa Bakinskikh Komissarov, 58, kv. 48, all of Sverdlovsk; Vladimir Zakharovich Gurevich, Yasny proezd, 4, korpus 1, kv. 20, Moscow; Nikolai Stepanovich Voronov, ulitsa Bogdana Khmelnitskogo, 68, kv. 18, and Ivan Fedorovich Agafonov, ulitsa Bogdana Khmelnitskogo, 101, kv. 69, both of Belgorod, all of U.S.S.R.

Filed Oct. 4, 1974, Ser. No. 512,153
Int. Cl.² B21D *7/16*
U.S. Cl. 72—128 **3 Claims**



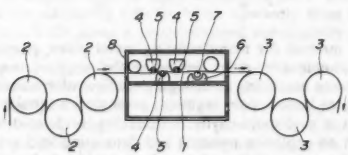
1. An apparatus for bending pipes comprising: a bed supporting the pipe to be bent; a clamping bending head rotatably mounted on the bed in the bending plane; longitudinal guides on the bed; a heater mounted in these longitudinal guides; a first hydraulic cylinder mounted on the bed for moving said heater over said guides; and at least one further hydraulic cylinder for longitudinally feeding the pipe during the process of bending.

3,958,439

METHOD FOR RECOVERING DUCTILITY OF A COLD ROLLED METAL STRIP

Kiyoshi Kawaguchi, Kudamatsu; Hiroshi Harada; Kaoru Shoge, both of Tokuyama, and Kenji Ono, Kudamatsu, all of Japan, assignors to Toyo Kohan Co., Ltd., Tokyo, Japan

Filed May 28, 1974, Ser. No. 473,904
Claims priority, application Japan, May 31, 1973, 48-60270
Int. Cl.² B21D *1/05, 31/00*
U.S. Cl. 72—163 **3 Claims**



1. A method of recovering ductility of a cold rolled, annealed metal strip which has been cold rolled with more than 15% reduction after annealing, said method comprising:

a. applying tension to said metal strip, thereby plastically elongating it; and

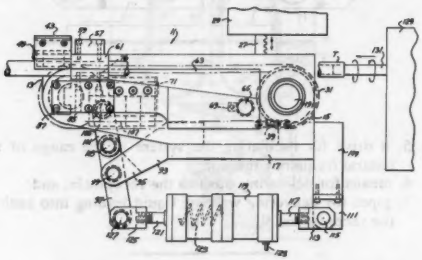
b. bending said strip while under said tension a plurality of times, the ratio of the radius of curvature of the bends to the thickness of the strip being less than 50:1.

3,958,440

UNIVERSAL TUBE BENDING MACHINE

Frank Sassak, 40979 Iriwn Drive, Mount Clemens, Mich. 48043

Filed Dec. 9, 1974, Ser. No. 530,699
Int. Cl.² B21D *7/024*
U.S. Cl. 72—307 **14 Claims**



1. In a universal tube bending machine, an elongated frame including parallel spaced side plates and a bottom plate;

an upper die clamp spaced laterally outward of a side plate, secured thereto and including an elongated downturned channel of semi-circular cross section adapted to receive the upper part of a tube to be bent;

an elongated support arm upon the outside of said side plate, at one end pivotally mounted thereon;

a lower die clamp overlying the other end of said arm secured thereto and including an elongated upturned channel of semi-circular cross section adapted to receive the lower part of a tube to be bent, for gripping said tube relative to the upper die clamp during bending and adapted to tilt downwardly after bending to release the tube;

a lower bending die secured upon said arm outwardly of and adjacent said lower die clamp, and having an arcuate channel to receive the tube, and of a radius corresponding to the radius of bend desired;

a power reciprocated bending arm including a bending arm block rotatably mounted on and transversely of said frame on a center corresponding to said lower bending die, and having an elongated undercut channel of semi-circular cross section for operative registry with said tube;

said bending die block being initially in registry with said die clamps and rotatable through an arc in the range of 1° to 180° approximately.

3,958,441

SKID RESISTANT SURFACE AND METHOD AND APPARATUS FOR FORMING THE SAME

Roger C. Haddon, Verona, Pa., and Jean-Pierre J. Habets, Broken Arrow, Okla., assignors to Aluminum Company of America, Pittsburgh, Pa.

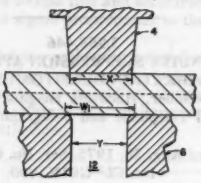
Filed Dec. 26, 1974, Ser. No. 536,630
Int. Cl.² B21K *23/00*
U.S. Cl. 72—352 **10 Claims**

1. A method of forming crack-free depressions in the wear surfaces of ribs on a floor member to improve skid resistance thereof, said method comprising the steps of:

a. supporting a floor member having at least one rib thereon against a die having an aperture therein with the rib on the floor member disposed on the side of the floor member opposite the die and overlying the die aperture which

has an effective extent less than the width of the base of the rib; and

b. displacing a segment of the rib toward the die aperture with a punch having a length along the rib greater than



the effective extent of the aperture in the same direction and a width across the full upper surface of the rib opposite the aperture in the die, and thereby move material from the floor member into the aperture to form a depression in said rib without cracking the floor member.

3,958,442

RATCHET TYPE HANDLE FOR CRIMPING TOOL AND THE LIKE

Gurbinder Singh Walia, and Alexander Sutherland Smith, both of Brampton, Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed Apr. 24, 1975, Ser. No. 571,361
Int. Cl.² B21D 9/08
U.S. Cl. 72—410 **4 Claims**

1. In a tool having a pair of arms pivotally coupled to each other to actuate a pair of jaws for crimping and the like:

the improvement comprising:

one of the arms having a shorter central segment and a longer end segment connected at a pivotable joint;

one of the segments having a ratchet coaxially disposed about said pivotable joint;

the other segment having a pawl which coacts with the ratchet so as to allow the free end of the arm to only swing open without relative movement of the central segment of said one arm with respect to the other arm;

said other segment having means for disengaging the pawl from the ratchet to enable the pair of jaws to be opened while the free ends of the two arms remain substantially closed and;

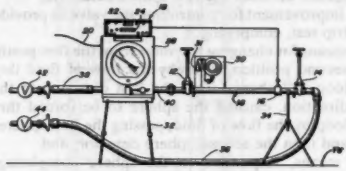
the axes of the pivotally coupled arms and the pivotable joint being parallel to each other.

3,958,443

APPARATUS FOR PROVING AND CALIBRATING CRYOGENIC FLOW METERS

Bruce Joseph Berrettini, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed June 17, 1974, Ser. No. 480,050
Int. Cl.² G01F 25/00
U.S. Cl. 73—3 **8 Claims**



1. Apparatus for proving, verifying, and calibrating flow meters used in dispensing cryogenic fluids comprising in combination:

a single non-venting length of conduit having means to admit and discharge fluid:

means in said conduit for measuring the temperature of the cryogenic fluid in said conduit;

means for measuring the pressure of the fluid flowing in said conduit;

a volumetric measuring device of the vortex shedding type in said conduit for measuring flow through said conduit; and

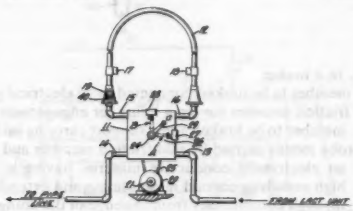
means for displaying flow rate as measured by the volumetric metering device whereby the apparatus can be used to measure temperature, pressure, volume, and flow rate for a given time increment and thus be used to prove volumetric or mass flow type meters.

3,958,444

SEMI-AUTOMATIC VALVE CONTROL FOR A PROVER LOOP

Edward A. Baker, Woodsboro, Tex., assignor to Sun Pipe Line Company, Tulsa, Okla.

Filed Jan. 27, 1975, Ser. No. 544,079
Int. Cl.² G01F 25/00
U.S. Cl. 73—3 **7 Claims**



1. In an apparatus for calibrating a flow meter which comprises,

a. a conduit section forming a prover loop, having enlarged sections on either end;

b. a valve for connecting the prover loop in series in a pipeline with the flow meter, and having a first position in which fluid from the pipeline passes through the loop in a first direction and a second position in which fluid passes through the loop in a second and opposite direction;

c. a sphere positioned within the loop so that it can be forced through the loop by the flow of fluid through the loop;

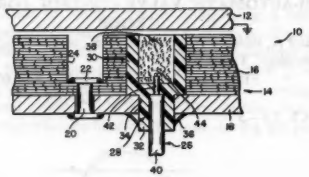
d. a first sphere detector located at a first location on the loop, for detecting the passage of the sphere past the first location and for producing a first signal;
e. a second sphere detector, located at a second location on the loop spaced from the first location a predetermined distance, for detecting the passage of the sphere past the second location and for producing a second signal, and
f. means for measuring the time elapsed in passage of the sphere between the two sphere detectors,
an improvement for controlling the valve to provide a round trip test, comprising:
g. means for changing the valve from the first position to the second position, whereby the flow of fluid through the loop will change from the first direction to the second direction, causing the sphere to be forced through the loop by the flow of fluid, passing the first sphere detector and then the second sphere detector; and
h. means, responsive to the sphere completing passage through the predetermined distance between the first and second sphere detector, for causing the valve to change from the second position to the first position, so that the flow of fluid through the loop will change from the second direction to the first direction, causing the sphere to be forced back through the loop by the flow of liquid before it reaches the enlarged section of the prover loop, passing the second sphere detector and then the first sphere detector.

3,958,445

PROPORTIONAL BRAKE LINING WEAR SENSOR

Donald W. Howard, and Richard T. Burnett, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Aug. 30, 1973, Ser. No. 393,109
Int. Cl.² B60T 17/22; G01N 3/56
U.S. Cl. 73—7 **5 Claims**



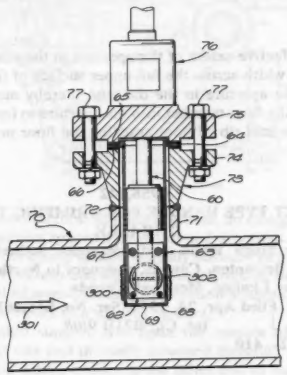
1. In a brake:
a member to be braked connected to an electrical ground;
a friction member having a lining for engagement with said member to be braked and a support carrying said lining;
probe means carried by said friction member and including an electrically conductive material having a relatively high resistivity carried in said lining and extending therethrough continuously from the edge of the lining engaging the member to be braked toward said support, the transverse cross-sectional area of said resistance material intermediate the edges of said lining being non-uniform, and a conductor carried by said support and electrically connected to said conductive material, said conductive material defining a circuit path between said conductor and the member to be braked, whereby the resistance of the circuit path between said terminal and the member to be braked during engagement of said lining with the latter will decrease as said material is worn away as the lining wears, said conductor projecting into said electrically conductive material so that the end of the conductor will engage said member to be braked when said lining is worn a predetermined amount, the transverse cross-sectional area of the resistance material tapering from a maximum cross-sectional area at the edge of the lining adapted to engage the member to be braked to a minimum cross-sectional area at the end of said conductor;
a warning device; and
circuit means for applying a voltage across said probe when the lining is engaged with the member to be braked and actuating said warning device when the voltage drop across said probe drops below a predetermined level.

3,958,446

DISCONTINUITY SUPPRESSION APPARATUS FOR VIBRATION DENSITOMETERS

Milton H. November, Hacienda Heights, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 20, 1975, Ser. No. 606,026
Int. Cl.² G01N 9/00
U.S. Cl. 73—32 A **9 Claims**



1. In a vibration densitometer having probe means for immersion in a fluid flowing in a pipeline, apparatus for increasing the densitometer accuracy by suppressing abrupt changes in the characteristic curve of the actual density of the fluid versus the resonant frequency of vibration of the densitometer, said apparatus comprising: a hollow cylindrical well for immersion in the pipeline in a location surrounding said probe means, said well having an axis located in a position approximately normal to the direction of fluid flow in the pipeline, said well having a cover in a first plane about normal to said well axis substantially sealing the end of said well for furthest immersion in the fluid, said well having first, second and third holes through the wall thereof near the same distance from said cover, said second and third holes having axes located in respective planes through the well axis and respectively disposed about +140° and about −140° from a second plane through the axis of said first hole and through said well axis, said first hole being employed for location centrally through one half of the well from the other half thereof toward which the fluid flow is directed; and a woven mesh mounted on said well contiguous to the external surface thereof covering each of said first, second and third holes.

3,958,447

MASS FLOWMETER

Roger E. Baker, Redmond, and Le Roy E. Vetsch, Lynnwood, both of Wash., assignors to Eldec Corporation, Lynnwood, Wash.

Filed July 9, 1975, Ser. No. 594,604
Int. Cl.² G01F 1/12, 1/76; G01N 9/32
U.S. Cl. 73—32 R **8 Claims**

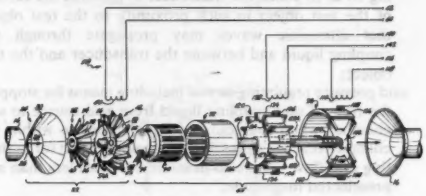
1. An apparatus for measuring changes in the mass flow rate of a fluid substantially as they occur, comprising:

first means generating a first signal proportional to the mass flow rate of the fluid;

second means generating a second signal proportional to the volumetric flow rate of the fluid and which changes substantially simultaneously with changes in the volumetric flow;

means responsive to said first and second signals for generating a control signal proportional to the density of the fluid; and,

means for multiplying said second signal and said control signal together, thereby generating an output signal which is proportional to the mass flow rate of the fluid and which changes substantially simultaneously with changes in the volumetric flow.



4. An apparatus for measuring the density of a flowing fluid, comprising:

first means generating a series of pulses having a pulse separation proportional to the mass flow rate of the fluid;

second means for generating a substantially sinusoidal signal having a frequency proportional to the volumetric flow rate of the fluid;

means generating a DC reference signal;

first circuit means responsive to said second means and said DC reference signal for generating a control signal which is inversely proportional to the volumetric flow rate of the fluid; and,

means responsive to said series of pulses and said control signal for generating an output signal proportional to the density of the fluid.

3,958,448

TEST APPARATUS FOR PRESSURIZED CONTAINER AND METHOD

Wilburn C. Willis; William L. Denhart, both of Hagerstown; Frank M. Kelly, and Joseph A. Clements, both of Richmond, all of Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 10, 1974, Ser. No. 513,718

Int. Cl.² G01M *3/02*

U.S. Cl. 73—37 **13 Claims**

1. A pressure testing apparatus for sealed rigid containers comprising:

a container receiving enclosure defined by a base wall, at least one side wall and a top wall,

a container supporting pedestal positioned within said container receiving enclosure and having an upwardly facing container supporting surface,

a needle projecting from said container supporting pedestal,

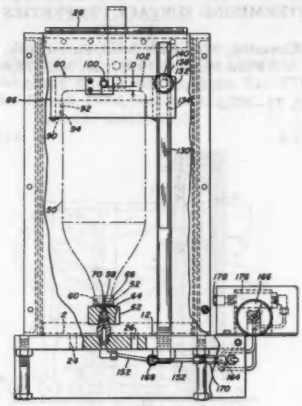
pressurized fluid supply means,

fluid carrying lines providing communication with said pressurized fluid supply means and said needle,

pressure controlling means interposed between said fluid supply means and said needle,

a container retaining member disposed within said container receiving enclosure in spaced overlying relationship with respect to said container supporting pedestal, said container retaining member having an elongated bore, an internally threaded passageway oriented generally transversely with respect to said bore and in communication therewith, and a locking bolt threadably engaged within said passageway, and

container retaining member adjustment means for permitting movement of said container retaining member to provide the desired position with respect to a specific container, said adjustment means having a post portion



extending through said bore of said container retaining member, said locking bolt within said passageway of said container retaining member adapted to move into and out of locking engagement with said post to secure said container retaining member to said post.

3,958,449

PROCESS AND APPARATUS FOR TESTING PIPELINES FOR LEAKS

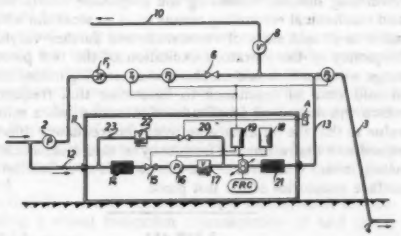
Georg Drescher, Erftstadt Liblar, and Karl-Heinz Uhle, Bruhl, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 29, 1975, Ser. No. 572,839

Claims priority, application Germany, May 9, 1974, 2422561

Int. Cl.² G01M *3/30*

U.S. Cl. 73—40.5 R **7 Claims**



1. A process for testing liquid-conveying pipelines for leaks during inoperative periods, which comprises: hermetically closing the pipeline at its two ends; continuously measuring the pressure prevailing in the interior of the pipeline; introducing into the closed pipeline, upon the pressure prevailing therein being found to drop, a substitute liquid similar to that normally conveyed therethrough, the substitute liquid being introduced in the quantity necessary to make up for that decrease in volume of the normally conveyed liquid which is caused by the relevant temperature drop, and an alarm device being actuated if the pressure continues to drop; and, upon the actuation of the alarm device, ascertaining the size of the leak

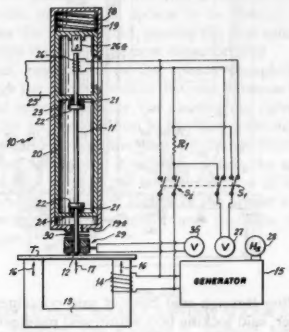
as an inference from the quantity of substitute liquid introduced per unit time into the closed pipeline.

3,958,450

RESONANT SENSING DEVICES AND METHODS FOR DETERMINING SURFACE PROPERTIES OF TEST PIECES

Claus Kleesattel, 9841-64th Road, Forest Hills, N.Y. 11374

Filed May 19, 1975, Ser. No. 578,946
Int. Cl.² G01N *3/48, 29/00*
U.S. Cl. 73—67.2 **22 Claims**



1. The method of determining the surface properties of a test piece comprising holding a mechanical resonating means against a surface of the test piece with a static force sufficient to maintain steady contact with the test piece at a contact surface shaped to provide increasing areas of contact with increasing deformation of the test piece surface by the shaped contact surface, exciting the test piece into vibration with a frequency which is varied to cause said mechanical resonating means to attain a state of resonance in dependence on the mechanical coupling between said mechanical resonating means and the test piece at said area of contact therebetween, measuring the amplitude of vibration of the vibrated test piece at a region of the latter which is adjacent to, and outside of said area of contact of the test piece with the mechanical resonating means, measuring the amplitude of vibration of said mechanical resonating means so as to ascertain when the latter is in said state of resonance, and further varying the frequency of the vibratory excitation of the test piece in a range within which said mechanical resonating means remains in said state of resonance to determine that frequency at which the measured amplitude of vibration has a minimum value so that the difference between the frequency thus determined and the resonance frequency of said mechanical resonating means when free of the test piece is an indication of the surface properties of the test piece.

3,958,451

ULTRASONIC INSPECTION APPARATUS

Anthony Charles Richardson, Houston, Tex., assignor to Inspection Technology Development, Inc., Houston, Tex.

Filed Dec. 12, 1973, Ser. No. 426,671
Int. Cl.² G01N *29/04*
U.S. Cl. 73—67.8 S **2 Claims**

1. An ultrasonic apparatus for detecting flaws in a test object having at least one surface, said apparatus being adapted to receive coupling liquid for transmitting ultrasonic waves between said apparatus and said test object, said apparatus comprising:

a source of said coupling liquid;

a housing having a hollow chamber with an opening towards the surface of the test object;

a seal attached to the housing around the opening, said seal slidably engaging the surface of the test object and retaining said coupling liquid in the hollow chamber of said housing;

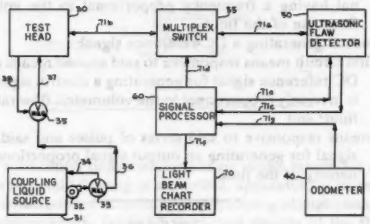
a pressure regulating device in communication with said hollow chamber and with said source for supplying said coupling liquid to the chamber from said source and for maintaining said liquid at substantially constant pressure within the chamber;

at least one ultrasonic transducer mounted in said hollow chamber so that said coupling liquid in said housing conducts ultrasonic waves between said transducer and said test object;

means cooperating with said housing for moving said housing so as to cause the transducer to traverse the surface of the test object in such proximity to the test objec that ultrasonic waves may propagate through the coupling liquid and between the transducer and the test object;

said pressure regulating device including means for stopping the flow of said coupling liquid from said source to said chamber when the coupling liquid pressure within the chamber reaches a preselected magnitude and for permitting said flow when said pressure becomes less than said preselected magnitude;

said pressure regulating device having a hollow cavity and first, second and third channels communicating between said cavity and the exterior of said device;



first flow means communicating between said source of said coupling liquid and said first channel;

second flow means communicating between said second channel and said hollow chamber;

third flow means communicating between said hollow chamber and said third channel;

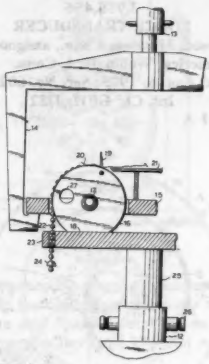
a valve member disposed in said cavity of said pressure regulating device, said valve member being responsive to pressure of said liquid in said third channel so that said valve member stops the flow of said coupling liquid through said cavity when said pressure in said third channel reaches a preselected magnitude and permits the flow of said coupling liquid through said cavity when said pressure in said third channel reaches said preselected magnitude,

whereby said coupling liquid flows from said source through said first flow means, said first channel, said cavity, said second channel and said second flow means to said hollow chamber and from said hollow chamber through said third flow means and third channel to said cavity except when the pressure in said hollow chamber, third flow means and third channel reaches a preselected magnitude and said valve member stops the flow of said coupling liquid through said cavity to said hollow chamber, thus maintaining substantially constant liquid pressure within said chamber.

3,958,452
UNIFORM PLANAR STRAIN TESTER

Charles B. Hassenboehler, Metairie, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 23, 1975, Ser. No. 543,705
Int. Cl.[2] G01N *3/08*
U.S. Cl. 73—95 1 Claim



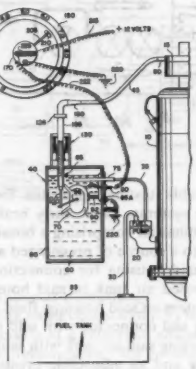
1. A device for imparting a uniform state of strain to a textile comprising in combination:

A first generally disk-shaped plate carrying a plurality of pulleys, each pulley holding an integral needle, means associated with first said plate for supporting a portion of a specimen encircled by the array of needles, a second generally disk-shaped plate, means associated with said second plate and pulley to provide controlled movement and indexing of the pulleys of said first plate, and means for supporting said first plate, said second plate, said supporting means adapted for attachment to external means for separating said plates, in the form of a tensile-testing machine, said first generally disk-shaped plate, carrying a plurality of rotatable, radially mounted, generally disk-shaped pulleys spaced symmetrically relative to its adjacent counterpart pulleys, perpendicular to plane of first said plate, each pulley, when oriented in sample loading position, holding a needle (for gripping the specimen) mounted in a plane parallel to the plane of the pulley on a line generally parallel to a radius of the pulley, said pulley radius perpendicular to said first plate, with the extending point of said needle directed away from said first and said second plate, a specimen support means comprising a generally disk shaped surface parallel to first said plate said surface supporting portion of specimen encircled by needles during relaxation of forces on needles, said surface situated generally level with plane formed by the intersection of the pulley periphery and integral needles when said elements of the apparatus are in the specimen loading position said support means not contacting specimen during stretching of the specimen, driving means for each pulley comprising a chain, one end of which is removably mounted to pulley adjacent base of said needle, said chin lying along periphery of said pulley, said chain proceeding outboard around pulley through said first plate through said second generally disk-shaped plate, said second plate having a plurality of holes equal in number to number of chains, said holes of sufficient diameter to pass chain with clearance, chain length-dictating stop means associated with chain and said second plate to define minimum positive separation of said first and said second plates at which pulley rotation is initiated, support means for said second plate adapted to attach to external means in the form of a crosshead of a tensile-testing machine, and indexing means associated with each pulley, said indexing means adapted to rotationally establish said pulley in the specimen loading position.

3,958,453
GASOLINE MILEAGE INDICATOR SYSTEM

Farrell G. Butler, Jr., P.O. Box 763, Pearland, Tex. 77581

Filed Nov. 8, 1974, Ser. No. 522,061
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—114 8 Claims



1. An instantaneous mileage indicator system for a motor vehicle, including

a. fuel line means for supplying fuel to the vehicle engine,

b. a float device connected to said fuel line means and having a float member which changes position in dependence on the flow rate of fuel passing through said fuel line means,

c. signal sending means connected to said float member for providing an electrical signal representative of said flow rate of fuel,

d. electrical gauge means connected to said signal sending means for rotating a first shaft in dependence on said electrical signal,

e. speedometer means connected to the drive train of said motor vehicle for rotating a second shaft in dependence on the speed of said motor vehicle,

f. first disc means secured to said first shaft for providing a visual indication representative of said flow rate of fuel, and

g. second disc means secured to said second shaft for providing a visual indication representative of said motor vehicle speed,

said first and second discs being juxtaposed and at least one of said discs having indicating means thereon for providing a visual indication of the instantaneous value of the distance traveled by said vehicle per quantity of fuel supplied to said engine, said visual indication of said instantaneous value being dependent on relative rotation of said first and second discs, and said float member comprising a piston loosely positioned in a vertically movable tube mounted in a housing for the signal sending means, and spring means within said tube for biasing said piston downwardly in said tube, the increased fuel flow rate raising said piston against the bias of said spring means, said tube being dimensioned so that vertical

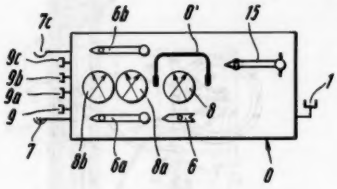
movement of said tube effects calibration of said apparatus.

3,958,454

PORTABLE TESTING APPARATUS FOR TESTING OF FLUID-OPERATED BRAKE SYSTEMS

Gerhard Rasch, Ginsheim-Gustavsburg, Germany, assignor to Flughafen Frankfurt/Main Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 9, 1975, Ser. No. 585,292
Int. Cl.² G01L 5/28
U.S. Cl. 73—121 8 Claims



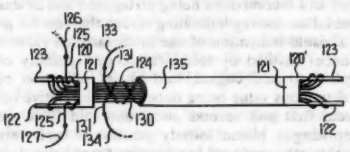
1. In a portable testing apparatus for testing of fluid-operated brake systems, particularly brake systems of land vehicles, a combination comprising a housing having a device for connection to a source of pressurized air; first and second connectors in said housing for connection to brake system lines; a compressed air tank in said housing; at least three double manometers on said housing; fluid couplings provided on said housing and connected with said manometers; a first fluid line connecting said air tank with said device and having a one-way valve and an adjustable pressure regulator interposed in it; a second fluid line connecting said air tank with said first connector; a third fluid line connecting said air tank with said second connector and having a one-way valve interposed in it; a multi-position manually operable air spring regulating valve interposed in said second line and having a valve body, an operating handle for moving said valve body between two operative end positions, and a centering-spring arrangement for centering said handle in a first position in which said valve body is in an intermediate blocking position; and a control arrangement in circuit with said air spring valve and connected with said air tank and first connector, said control arrangement including a one-way valve and a blocking valve intermediate said air tank and said first connector and another blocking valve intermediate said air tank and said second connector.

3,958,455

FORCE TRANSDUCER FOR STRAIN GAGE

John D. Russell, 26878 Sea Vista Drive, Malibu, Calif. 90265

Continuation of Ser. No. 399,487, Sept. 21, 1973, abandoned, which is a continuation of Ser. No. 154,502, June 18, 1971, abandoned. This application Apr. 30, 1975, Ser. No. 573,089
Int. Cl.² G01L 1/22
U.S. Cl. 73—141 A 6 Claims



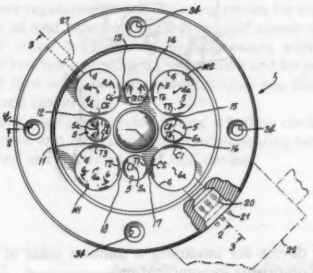
3. A resistance element type force transducer comprising a pair of spaced apart load attaching elements, a plurality of conductive resistance elements mechanically connecting said load attaching elements, said resistance elements being insulated from said load attaching elements and from each other and being conductively connected at their alternate ends in series, said resistance elements being in the form of wires grouped in intimate contact in a self supporting arrangement devoid of any spacing elements with said individual wires being connected in series by conductive connections and means for connecting said serially connected resistance elements to an electric circuit.

3,958,456

FORCE TRANSDUCER

Walter E. Jacobson, Meriden, Conn., assignor to Revere Corporation of America, Wallingford, Conn.

Filed Aug. 6, 1975, Ser. No. 602,326
Int. Cl.² G01L 1/22
U.S. Cl. 73—141 A 9 Claims



1. A force transducer, comprising:

a. a cylindrical block of elastic material having a diameter greater than its axial length, said block having:

1. two arrays of *n* cylindrical holes, where *n* is greater than two, each hole extending parallel to the axis of the cylindrical block and spaced therefrom, the axes of the holes in one of said arrays intersecting a plane perpendicular to the block axis at the corners of an *n*-sided polygon whose center is at the intersection of the block axis with said plane, the axes of the holes in the other array intersecting said plane at the midpoints of the sides of said *n*-sided polygon,

2. said arrays of holes separating a central load carrying portion of said block, adapted at one end to oppose a force acting axially of the block, from a peripheral load carrying portion and adapted at the opposite end to oppose a second force acting axially in opposition to the first force, said holes defining the axially extending surfaces on *n* pairs of parallel bridging portions extending between said central portion and said peripheral portion; and

b. a plurality of strain sensitive elements, mounted on the surfaces of said bridging portions, inside the adjacent holes.

3,958,457

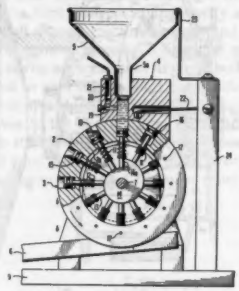
ELECTRONICALLY OPERATED TIPPING-BUCKET RAIN GAUGE

James W. Mink, Colts Neck, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 26, 1975, Ser. No. 617,212
Int. Cl.² G01W 1/14
U.S. Cl. 73—171 11 Claims

1. A gauge for measuring low-to-moderate rainfall rates comprising, rain water collection means, rotary bucket wheel means having a plurality of peripherally spaced buckets positioned beneath and communicating with said rain water col-

lection means, motor means connected to the bucket wheel means for rotating said bucket wheel means, and electrical means connected between said rain water collection means and said motor means and responsive to the level of the collected rain water, whereby when a predetermined level of water is attained in the collection means the motor means is energized to rotate said bucket wheel means to thereby remove an increment of water from the rain water collection means.

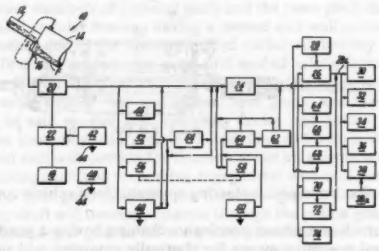


3,958,458

ACOUSTIC EMISSION FLOW MEASUREMENT SYSTEM

Kenneth M. Foreman, North Bellmore, and Richard A. Oman, Huntington, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Aug. 26, 1974, Ser. No. 500,519
Int. Cl.² G01F *1/20*
U.S. Cl. 73—194 B **13 Claims**



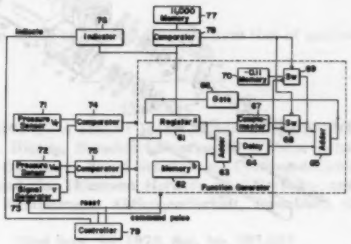
13. A method of determining flow in a conduit having a discontinuity therein comprising the steps of: securing a transducer to the exterior of said conduit and within the near field of such discontinuity, said transducer being resonsive to pseudo-sound radiation; sensing with said transducer the sound pressure level signal generated by the interaction of the fluid flowing over said discontinuity; converting the signal derived from said transducer into a frequency-amplitude distribution; selecting an amplitude from said distribution at a predetermined frequency corresponding to the characteristic frequency of the discontinuity; calibrating said selected amplitude with given data; and utilizing said calibrated amplitude to calculate flow velocity in accordance with the formula $A = U^4$, where A is the calibrated amplitude and U is the flow velocity.

3,958,459

BAROMETRIC ALTIMETER

Naonobu Shimomura, 13-8 Sakuragaoka-cho, Shibuya, Tokyo, Japan

Filed Oct. 26, 1973, Ser. No. 410,116
Claims priority, application Japan, Oct. 28, 1972, 47-108314; Jan. 12, 1973, 48-6404; Dec. 30, 1972, 48-1344; Jan. 12, 1973, 48-6405; Feb. 2, 1973, 48-13510; Mar. 2, 1973, 48-25296; Aug. 27, 1973, 48-95952
Int. Cl.² G01L *7/00*; G06F *7/38*; G06G *7/00*
U.S. Cl. 73—384 **7 Claims**



1. A barometric altimeter comprising:

means for generating an electrical signal V_r representing the atmospheric pressure at a reference altitude,

means including a pressure sensor for generating an electrical signal V_m responsive to the atmospheric pressure at the altitude to be measured,

means for generating an electrical signal v varying exponentially with time,

means comparing said electrical signal v for coincidence with said electrical signals V_r and V_m for generating electrical pulses at the respective times of coincidence, t_r and t_m,

a function generator containing a shift register loaded with a predetermined initial value, a memory storing a constant value and being non-destructively readable, a delay circuit, a complementer, first and second adders and a command pulse generator producing command pulses of a frequency determined in relation to the known characteristics of the pressure sensor, the output of said shift register being connected to one of the inputs of said first adder and also to the input of said complementer, and the output of said memory being connected to the other input of said first adder, and the output of said first adder being connected to the input of said delay circuit, and the output of said complementer being connected to one of the inputs of said second adder, and the output of said delay circuit being connected to the other input of said second adder, and the output of said second adder being connected to the input of said shift register, said function generator including means for reading out said shift register and said memory simultaneously in response to each of said command pulses in operation of said function generator,

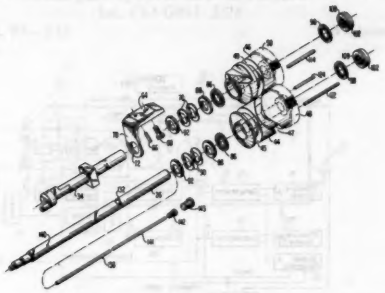
means to control the operation of said function generator to initiate operation thereof in response to the earlier generated one of said electrical pulses generated at the times t_r and t_m and to terminate the operation thereof in response to the later generated one of said electrical pulses generated at the times t_r and t_m, and

said register, at termination of operation of said function generator, storing therein a value representative of the altitude to be measured.

3,958,460
SEWING MACHINE NOISE AND VIBRATION REDUCTION

Bernard N. Pierce, West Hartford, Conn., assignor to The Merrow Machine Company, Hartford, Conn.

Division of Ser. No. 356,851, May 3, 1973, Pat. No. 3,812,802.
This application Apr. 25, 1974, Ser. No. 464,261
Int. Cl.² F16H *25/12*
U.S. Cl. 74—57 **7 Claims**



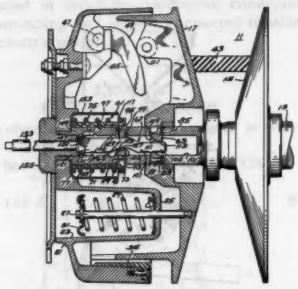
1. In a cam drive mechanism including a cam cylinder mounted in a fixed frame for rotation about a longitudinal axis, a pair of oppositely directed substantially radially extending shoulders on said cam cylinder and disposed in closely spaced opposed relation one to each of a pair of radially extending fixed bearing surfaces on said frame, an endless cam track extending around the outer periphery of said cam cylinder for engaging and driving a cam follower in a direction having a component extending parallel to said longitudinal axis whereby said cam follower applies a reaction force tending to move said cam cylinder axially between said fixed bearing surfaces upon rotation of said cam cylinder, the improvement comprising a pair of antifriction axial thrust bearing assemblies each including a plurality of radially extending antifriction roller bearing elements retained in an open bearing cage and mounted one between each of said shoulders and the opposed fixed bearing surface and engaging a substantially radially extending inner race rotating with said cam, a pair of outer races in the form of annular washers having a substantially radially extending bearing surface mounted on said shaft one between each thrust bearing and the adjacent fixed bearing surface and normally retained against rotation, compression spring means mounted between one of said outer races and the adjacent opposed fixed bearing surface, said compression spring means continuously applying an axial force urging said one outer race and its associated axial thrust bearing and thereby said cam cylinder toward the other said axial thrust bearing with an axial force greater than said reaction force whereby movement of said cam cylinder along said longitudinal axis by said reaction force is prevented, and means supplying lubricating oil through one of said outer races for lubricating the associated thrust bearing and the cam track.

3,958,461
TRANSMISSION DRIVE PULLEY ASSEMBLY WITH SELECTIVE DRIVE AND INCLUDING RATCHET MECHANISM

Olav Aaen, Kenosha, Wis.; Edgar Rose, Glencoe, and Anthony Prince, Waukegan, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Sept. 25, 1974, Ser. No. 509,139
Int. Cl.² F16H *55/52*
U.S. Cl. 74—230.17 E **16 Claims**

12. A variable transmission drive pulley assembly comprising a drive shaft, a fixed sheave connected to said drive shaft for common rotation therewith, a movable sheave carried by said drive shaft for movement axially thereof toward and away from said fixed sheave, means urging said movable sheave away from said fixed sheave, first means operable in response to rotation of said drive shaft for displacing said movable

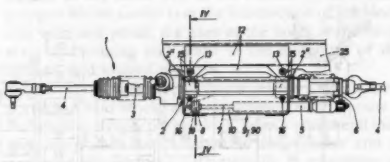


sheave axially of said drive shaft toward said fixed sheave, second means operable independently of said first means for displacing said movable sheave axially of said drive shaft and control means operable selectively for controlling operation of said first and second means for displacing said movable sheave.

3,958,462
RACK AND PINION STEERING MECHANISM AND THE MOUNTING THEREOF AT AN AUTOMOTIVE VEHICLE

Wolfgang Matschinsky, Munich, and Hans-Jochem Hadrys, Oberschleissheim, both of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Germany

Filed May 5, 1975, Ser. No. 574,451
Claims priority, application Germany, May 3, 1974, 2421498
Int. Cl.² B62D *1/20*; F16H *55/14*
U.S. Cl. 74—498 **36 Claims**



1. Rack and pinion steering apparatus for a vehicle comprising:

a rack and pinion steering mechanism having a gearbox,

and mounting means for elastically mounting said steering mechanism to a fixed vehicle part,

said mounting means including a diagonally rigid holding means encompassing said gearbox in frictional engagement therewith by way of an elastic intermediate layer, said holding means being directly attachable to said fixed vehicle part.

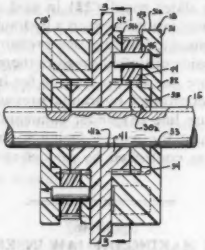
3,958,463
ADJUSTABLE CAM ACTUATED SWITCH MECHANISM

Bruce E. Block, and Roger H. Stohlquist, both of Rockford, Ill., assignors to Rockford Automation, Inc., Rockford, Ill.

Filed June 20, 1975, Ser. No. 588,606
Int. Cl.² F16H *53/04*
U.S. Cl. 74—568 R **5 Claims**

1. In a cam actuated switch mechanism including a switch having a control element and adapted to be operated by dis-

placement of the control element, a timing shaft, a rotary cam means on the timing shaft, and a cam follower engageable with the cam means for operating the switch control element in response to rotation of the cam means, the improvement comprising: said cam means including an annular housing having the first end wall at one end mounted for rotation relative to the timing shaft and a peripheral wall extending from said first end wall coaxial with the timing shaft, the housing having a first gear receiving cavity extending from said first end wall around the timing shaft and opening at the other end of the annular housing, a first spur gear in said first gear receiving cavity adjacent said first end wall and non-rotatably connected to said timing shaft for rotation therewith, a second spur gear in said first gear receiving cavity mounted for rotation relatives to the shaft, a cam plate mounted for rotation relative to the timing shaft and non-rotatably connected to said second spur gear, said cam plate overlying the other end of the housing to close said first gear receiving cavity and



having cam lobe means on its outer periphery for actuating the cam follower, said first and second spur gears having relatively different numbers of external teeth and the same pitch diameter, said annular housing having a second end wall portion at said other end of the housing spaced radially outwardly from said first and second spur gears and spaced axially from said first end wall to define a second gear receiving cavity radially outwardly of said first and second spur gears, and a pinion gear in said second gear receiving cavity and having shaft means mounting said pinion on said first end wall and said second end wall portion for rotation about an axis paralleling the timing shaft and in meshing engagement with said first and second spur gears whereby the first spur gear driven by the timing shaft will normally operate through the pinion gear and the second spur gear to drive the cam plate in unison with the timing shaft, and turning of said housing relative to the timing shaft causes turning the cam plate relative to the timing shaft at a reduced rate.

3,958,464

LIMITED SLIP DIFFERENTIAL

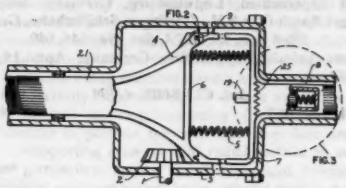
Janis Kronbergs, 947 Tavistock Road, Ottawa, Canada (K2B 5NG)

Continuation-in-part of Ser. No. 398,145, Sept. 11, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,601

Int. Cl.² F16H *1/38*

U.S. Cl. 74—710 **7 Claims**

1. A limited slip differential comprising input drive means, a pair of axles for delivering power to each of a pair of wheels coupled thereto, an annular gear means coupled to each of said axles and said input drive means for driving said axles, and resilient means coupling said annular gear means to at least one of said axles to thereby transfer power to said axle



which can rotate at a speed different from that of said other axle.

3,958,465

DRIVING OF A SHAFT WITH PENDULUM MOUNT

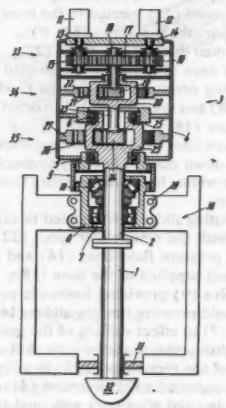
Heinz M. Hiersig, Dusseldorf-Oberkassel; Wilhelm Schafer, Witten-Bommern; Bernd Schuhmann, Dortmund-Eichlinghofen, and Max Thiemann, Herbede, all of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Sept. 18, 1974, Ser. No. 507,053

Claims priority, application Germany, Sept. 18, 1973, 2347608

Int. Cl.² F16H *1/28, 57/00*

U.S. Cl. 74—801 **14 Claims**



1. Apparatus for driving a shaft at a low speed and in relation to a frame, support or the like comprising;

a reducing gear having a casing and at least one input shaft and one output shaft, the output shaft being rigidly secured to the shaft to be driven;

a pair of axially spaced bearings journalling the casing on the output shaft;

a pendulum or swing bearing for journalling the interconnected output and driven shafts on the frame;

means interconnecting the frame and the casing without preventing pendulum motion of the latter relative to the former, for inhibiting rotation of the casing relative to the frame; and

a drive motor connected to the input shaft.

3,958,466

ELECTRO-HYDRAULIC GEAR SHIFTING CONTROL FOR VEHICLE GEARS

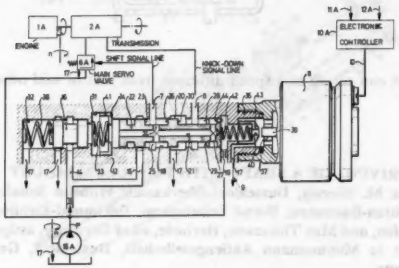
Helmut Espenschied, Ludwigsburg, Germany, assignor to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany

Filed Feb. 27, 1974, Ser. No. 446,140

Claims priority, application Germany, Apr. 19, 1973, 2319961

Int. Cl.² B60K 41/04

U.S. Cl. 74—867 4 Claims



1. Electro-hydraulic gear shifting control unit for vehicle gears having hydraulic gear shift controllers for the vehicle transmission gears providing different gear ratios for the vehicle and having a spool valve (9) comprising

a unitary housing (12);

a single valve spool bore (18) formed in the housing;

a main slider spool (22) located in the bore (18);

a source of hydraulic pressure (16A; P);

ring ducts formed in the slider spool (22);

pressure fluid lines (14, 15, 19) connected to said source and providing pressurized hydraulic fluid connected to the bore (18) and drain lines (17) to drain hydraulic fluid from the bore (18);

control pressure lines (7, 8) including a shift signal line (7) and a kick-down control line (8) connected to the bore (18) and providing hydraulic pressure fluid to the vehicle transmission;

a pressure limiting slider (16) located in said bore in axial alignment with the main slider spool (22) connected to one of the pressure fluid lines (14) and controlling the pressure fluid supplied to the bore (18);

said spool valve (9) providing hydraulic pressure, as controlled by said pressure limiting slider (16) over the shift signal line (7) to effect shifting of the gears by supplying a shift control pressure to the gear shift controller upon axial shift of the slider spool (22) in a first direction;

a resiliently supported (32) abutment (41) located in said bore (18), in axial alignment with, and facing the slider spool (22) and located to be resiliently engageable by said spool (22) upon movement of said spool in said one direction;

the main slider spool (22) being formed with an axial blind bore (21);

a first diametrical cross bore (24) communicating the axial blind bore (21) with the outside surface of the slider spool, and terminating in a first ring duct (25) formed in the housing and the spool,

and a second diametrical cross bore (27), axially offset from said first cross bore (24) communicating the axial blind bore (21) with the outside surface of the slider spool (22) and terminating in a second ring duct (28) formed in the circumference of the slider spool, one of said ducts (25) being located to communicate with the shift signal line (7) and to have pressure fluid applied thereto upon displacement of the main slider spool (22), and the other of said ducts (28) being located to communicate with the kick-down line (8) and to have pressure fluid applied thereto upon displacement of the main slider spool (22);

electro-hydraulic valve means (19, 39, 40, 43, 17; 11) electrically controlled by an engine operating parameter comprising at least one of: (a) engine speed; (b) engine throttle position; and controlling admission of pressurized hydraulic fluid from said source (16A; P) to said bore (18) to act on said slider spool (22) and thereby effect axial shift of said spool in said direction by applying a pressure, as controlled by said electro-hydraulic valve means on the main slider spool (22), the electro-hydraulic valve means providing a bias pressure on the main slider spool (22) and including

a hydraulic pressure connection (19) from said pressure source (16A; P) to an axially facing surface (44) of the slider spool;

and an electrically controlled valve (43, 40, 39; 11) controlled by said engine operating parameter controlling the pressure of fluid admitted from said pressure source (16A; P) acting on the main slider spool (22),

the pressure acting against the axially directed face of the main slider spool (22) being effective to shift the position of the main slider spool (22) in said one direction to effect communication between a hydraulic pressure fluid line (15) connected to said one pressure fluid line (14) and having said controlled pressure therein, and the kick-down pressure line (8) to provide for independent connection of controlled hydraulic pressure to said kick-down pressure line (8) under command of the pressure applied against the axially facing surface of the slider spool (22) as controlled by said electrically controlled valve.

3,958,467

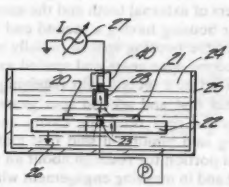
METHOD FOR MAKING DIE JAW INSERTS FOR TUBE CUTOFF MACHINES

John J. Borzym, Birmingham, Mich., assignor to Alpha Industries, Inc., Detroit, Mich.

Filed Mar. 31, 1975, Ser. No. 563,603

Int. Cl.² B21K 5/20

U.S. Cl. 76—107 R 3 Claims

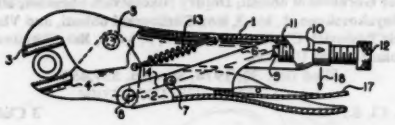


1. A method of fabricating die jaw inserts for cutoff apparatus wherein said inserts are of the type comprising a hardened metal body terminating in an edge and having a clamping aperture opening to said edge and adapted to mate with a reversely similar insert to clamp a workpiece therebetween, the method comprising the steps of: fabricating a pair of reversely similar insert blanks which are machined to final dimensions and hardened beyond practicable machining but wherein said edges are uninterrupted by said aperture; placing said pair of reversely similar insert blanks on opposite sides of a shim strip such that the sides of the respective inserts which are to become the gripping surfaces of the workpiece abut the shim strip; and electrical discharge machining a circular bore symmetrical about the shim strip through the inserts and of sufficient diameter to cause the resultant bore to define circular arcs in the insert bodies whereby when said inserts are juxtaposed without said shim strip the reversely similar apertures of said bodies form an opening of slightly elliptic character.

3,958,468
TOGGLE WRENCH HAVING PRESSURE CALCULATOR MEANS

Robert W. Weller, P.O. Box 398, Lomita, Calif. 90717

Filed June 13, 1969, Ser. No. 832,908
Int. Cl. B25b 7/12
U.S. Cl. 81—368 3 Claims

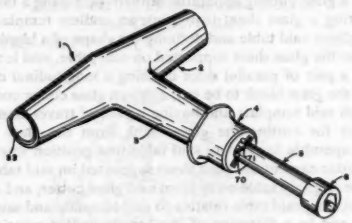


1. A toggle wrench comprising the combination of a first handle provided with a fixed jaw, a movable jaw mounted on said first handle, a toggle comprising a channel shaped second handle lever pivotally secured at one end with said movable jaw and a toggle link pivotally attached at one end in the channel of said second handle lever between its ends and at its other end engaged with a variable abutment means carried by said first handle, and a pressure calculator means for determining the amount of pressure that will be exerted on the workpiece, said pressure calculator means comprising in combination a pressure rating scale and indicator, said pressure rating scale and said indicator being arranged for translating the angle of said second handle in relation to said toggle link into known units of pressure and being operable during clamping of said toggle wrench.

3,958,469
TORQUE WRENCH

John W. Meese, Avon, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 14, 1975, Ser. No. 621,739
Int. Cl.² B25B 13/00
U.S. Cl. 81—58.3 3 Claims

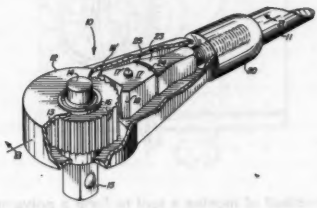


1. In a torque wrench of the type in which a shaft carrying ratchet teeth is axially aligned with and biased by a shaft spring toward a torque sleeve with complementary ratchet teeth, both said shaft and sleeve being mounted in a housing, said wrench shaft being supported in said housing for axial movement against the bias of the spring to permit said teeth to clear when the wrench is rotated in one direction, said wrench having a locking cup mounted on an end of said housing, said locking cup being spring biased toward a free end of said wrench shaft by a spring weaker than said shaft spring, said cup being mounted around said shaft and for axial movement with respect to said housing and shaft and having means cooperating with said housing when in an axial position close to said housing for restraining said locking cup against rotation relative to said housing and when in an axial position more remote from said housing, releasing said cup for rotation relative to said housing, said locking cup having an outer radial surface remote from said housing and a channel extending axially through said surface and adjacent said shaft, and said shaft having a substantially radially directed projection normally axially slidably seated in said channel, the improvement comprising said projection being positioned axially relative to the locking cup at a place at which when said locking cup is in said axial position close to said housing and the said shaft is moved axially in a direction to clear the ratchet teeth the said projection clears the outer radial surface of said locking cup, and a stop member having a stop face extending substantially axially from said radial surface at a place offset from said channel, said stop face being offset from said channel sufficiently to provide between said stop face and said channel a supporting area on said radial surface to support said shaft projection against axial movement toward said housing when said projection bears against said supporting area, and projecting axially sufficiently to engage positively the said shaft projection and prevent rotation of the said shaft relative to said housing in one direction.

3,958,470
DOUBLE ACTING RATCHET WRENCH WITH CAM ACTUATED OSCILLATORY PAWL

Bert Lee, 5010 Del Prado, Salt Lake City, Utah 84110

Filed June 26, 1975, Ser. No. 590,591
Int. Cl.² B25B 13/46
U.S. Cl. 81—63 8 Claims



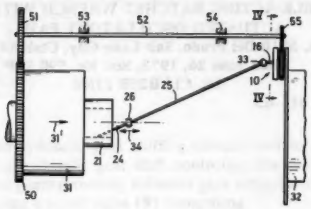
1. A ratchet wrench comprising:
a housing,
a ratchet wheel rotatably mounted in said housing,
pawl means pivotally mounted within said housing for oscillatory movement relative to said ratchet wheel,
said pawl means having a pair of dogs spacedly mounted at one end thereof for selectively engaging teeth on the periphery of said ratchet wheel when rotated in a predetermined manner,
said pawl means forming a cam follower at its other end,
a handle, one end of which is pivotally mounted in said housing to extend into said housing in close association with the cam follower of said pawl means,
said one end of said handle being provided with a cam surface,
said handle when pivoted about said housing causing said cam surface on its one end to engage the cam follower of said pawl means to rotate it about its pivotal connection to said housing causing a dog on its other end to engage a tooth of said ratchet wheel causing it to rotate a predetermined amount,
whereby a release of pressure on said handle causes it to move back to a neutral position disengaging said dog on said pawl means for the teeth on said ratchet wheel.

3,958,471

METHOD OF AND APPARATUS FOR MANUFACTURING WORKPIECES HAVING POLYGONYL INNER AND OUTER CONTOURS

Johann Muller, Friedenthal, Germany, assignor to Paul-Heinz Wagner Maschinenfabrikation, Much-Birren-bachshone, Germany

Continuation-in-part of Ser. No. 330,435, Feb. 7, 1973, abandoned. This application July 24, 1974, Ser. No. 491,315
Claims priority, application Germany, Feb. 8, 1972, 2205768
Int. Cl.² B23B 1/00, 5/44
U.S. Cl. 82—1 C 15 Claims



1. A method of moving a tool to form a polygonal outline having inner or outer polygonal contours based upon radii of predetermined inner and outer circles with *n* being the number of angles of the desired polygonal outline comprising the steps of rotating a workpiece to be outlined about a fixed axis, moving a tool along an ellipsoidal path in a plane perpendicular to the workpiece axis while in contact with the rotating workpiece with tool travel along the ellipsoidal path having a velocity varying generally sinusoidally as a function of tool location, said ellipsoidal path is radially offset from the workpiece axis of rotation, and synchronizing the relative rotation of the tool and the workpiece about its axis for a duration of movement of the tool along the ellipsoidal path by said factor *n*.

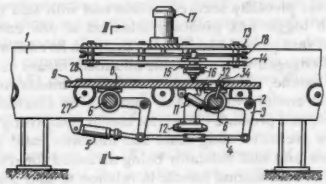
9. Apparatus for moving a tool to form a polygonal outline having inner or outer polygonal contours based upon radii of predetermined inner and outer circles with *n* being the number of angles of the desired polygonal outline comprising means for rotating a workpiece to be outlined about a fixed axis, means for moving a tool along an ellipsoidal path in a plane perpendicular to the workpiece axis while in contact with the rotating workpiece with tool travel along the ellipsoidal path in a plane perpendicular to the workpiece axis while in contact with the rotating workpiece with tool travel along the ellipsoidal path having a velocity varying generally sinusoidally as a function of tool location, said ellipsoidal path being radially offset from the workpiece axis of rotation, and means for synchronizing the relative rotation of the tool and the workpiece about its axis for a duration of time longer than the duration of movement of the tool along said ellipsoidal by the factor *n*.

3,958,472

APPARATUS FOR CUTTING OUT PREDETERMINED SHAPES

Nikolai Pavlovich Kabanov, Naberezhnaya Shevchenko, 3, korpus 3, kv. 50; Vitaly Sergeevich Schukin, Leninsky prospekt, 72, kv. 500, both of Moscow; Vladimir Nikolaevich Suvorov, ulitsa Shkolnaya, 2, kv. 6, Bor Gorkovskoi oblasti; Dmitry Nikolaevich Savonichev, ulitsa Shkolnaya, 4, kv. 8, Bor Gorkovskoi oblasti; Dmitry Nikolaevich Shepelev, ulitsa Mayakovskogo, 1, kv. 3, Bor Gorkovskoi oblasti, and Vladimir Pavlovich Chalov, ulitsa Mira, 3, kv. 2, Bor Gorkovskoi oblasti, all of U.S.S.R.

Filed Dec. 30, 1974, Ser. No. 537,453
Int. Cl.² B26D 3/08; C03B 33/04
U.S. Cl. 83—6 3 Claims



1. In a glass cutting apparatus of the type having a table for supporting a glass sheet to be cut; an endless template disposed above said table and defining the shape of a blank to be cut from the glass sheet supported on said table, said template having a pair of parallel sides defining a longitudinal dimension of the glass blank to be cut; a driven glass cutter cooperative with said template and having a path of travel along said template for cutting the glass blank from the glass sheet; means operable for raising said table to a position where the glass cutter can cut the glass sheet supported on said table and for lowering said table away from said glass cutter; and means for displacing said table relative to said template and said glass cutter, and in a direction of the longitudinal dimension defined by the pair of parallel sides of said template, thereby to vary the length of the longitudinal dimension of the glass blank; the improvement which comprises:

said means for displacing said table comprising a control system responsive to the position of said glass cutter along said template for effecting a displacement of said table during the course of cutting a glass blank, wherein the displacements during successive cuttings of glass blanks are alternately in opposite directions along the longitudinal dimension defined by the two parallel sides of said template, the displacement of said table occurring during each of the successive cuttings after said glass cutter has traveled from one to the other of the two parallel sides of said template, thereby to render alternate ones of the glass blanks successively longer and shorter than the length defined by said template; and

means for limiting the displacement of said table in the opposite directions to equal distances, whereby the average of the longitudinal dimensions of a pair of successive glass blanks is equal to the longitudinal dimension of said template.

3,958,473
APPARATUS FOR ELIMINATING FILAMENTARY WINDERS

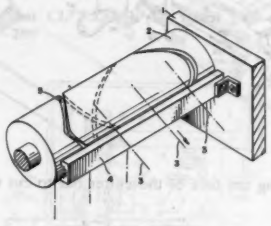
Erich Lenk, Remscheid-Lennep, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed June 18, 1975, Ser. No. 587,979

Claims priority, application Germany, June 18, 1974, 2429055

Int. Cl.² B26D 5/22

U.S. Cl. 83—98 **11 Claims**



1. A device for eliminating yarn laps from the surface of a rotating working roller, said device comprising:
- a runner movable within a guide parallel to the axis of the working roller;
- a means for cutting winders mounted on said runner,
- a means for driving said runner within said guide whereby said cutting means is guided over the surface of said working roller; and
- a means for coupling said rotating working roller to said runner driving means.

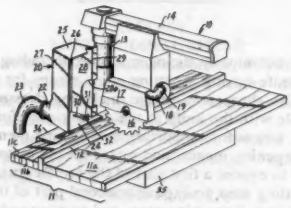
3,958,474
DUST COLLECTOR FOR RADIAL ARM SAWS

Lloyd D. Kreitz, P.O. Box 60, Pequot Lakes, Minn. 56472

Filed Mar. 31, 1975, Ser. No. 563,715

Int. Cl.² B27G 3/00

U.S. Cl. 83—100 **10 Claims**



1. In combination with a radial arm saw assembly comprising a saw base, a vertical column positioned within the perimeter of said base at the rear thereof a horizontal worktable positioned on said base in front of said column, said worktable including a front table and a rear table separated by a rip fence, a spacer board located at the back of said rear table, a horizontal arm rotatably attached to the upper end of said column so as to be positioned over said worktable, a rotary saw protected by a saw guard carried by said arm, a dust collector positioned at the rear of said worktable to the left of said column, said collector comprising a generally flat-bottomed funnel-shaped shroud having a wide inlet which opens toward the front of said worktable and a narrow outlet for connection to a vacuum hose, said inlet being positioned entirely above the plane of said worktable, said shroud being arcuately movable,

the improvement which comprises the floor of said shroud having a slot extending generally rearwardly, a bolt extending through both said slot and said spacer board to hold the bottom of the shroud in contact with the top of the spacer board,

whereby said shroud can be slid forward or backward and rotated about said bolt over the spacer board and rear table to align the outlet of the shroud with the direction of saw rotation.

3,958,475
SLICING MACHINE

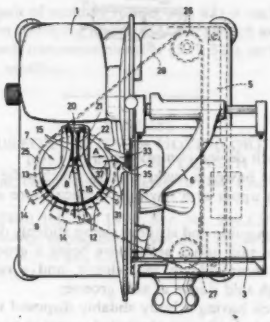
Johann Zapomel, Basel, Switzerland, assignor to Bizerba-Werke Wilhelm Kraut K.G., Balingen, Wurttemberg, Germany

Filed Nov. 5, 1974, Ser. No. 521,185

Claims priority, application Switzerland, Nov. 7, 1973, 15720/73; Feb. 8, 1974, 2007/74; Germany, May 31, 1974, 2426383

Int. Cl.² B26D 4/24

U.S. Cl. 83—112 **12 Claims**



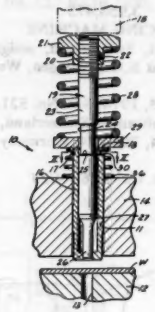
1. A slicing machine, comprising, in combination:
- a frame;
- a circular cutter blade rotatably mounted on said frame;
- a feed carriage slidably mounted on said frame to feed stock supported on said carriage towards said blade;
- a device to receive individual slices of said stock sequentially sliced by said blade, said device including a rotatably mounted body, a plurality of spikes mounted on said body to project therefrom by an amount sufficient to penetrate a plurality of said slices, and means to strip said slices from spikes, said stripper means including a movable member having a surface portion, and movable between a first position of said member and a second position, said member being movable in a direction substantially parallel to the longitudinal direction of said spikes to the second position, which is spaced from said first position by at least the length of said spikes, guide means, a member slidable along a path defined by said guide means, and a respective lever linkage connecting said movable member to said slidable member; and
- drive means to reciprocally displace said carriage and to angularly displace said body in such coordination with said diplacement of said carriage, that slices of said stock sequentially sliced by said blade are successively impaled on said spikes to form thereon a stack of slices, which may subsequently be detached from said receiver device by said stripper means.

3,958,476

PUNCHING DEVICE WITH PUNCH RETAINER

Kenneth J. Bartha, East Amherst, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed June 30, 1975, Ser. No. 591,888
Int. Cl.[2] B26F 1/14
U.S. Cl. 83—143 8 Claims



1. A punch device comprising:

a. a frame having a lower arm on which a die is supported, and an upper arm having a vertical bore aligned therewith;

b. a punch guide and stripper sleeve slidably disposed in the bore in said upper arm, there being a groove extending circumferentially in said sleeve, and a radial aperture through said sleeve at said groove;

c. a punch having a body slidably disposed in said sleeve, said body having an elongated recess in registration with said radial aperture;

d. a stripping spring acting between said sleeve and said punch to urge the lower end of said punch into said sleeve;

e. a lifting spring acting between said sleeve and said upper arm and urging said sleeve away from said die; and

f. a retainer member disposed in said groove and having a portion projecting radially through said radial aperture into said elongated recess in said punch body.

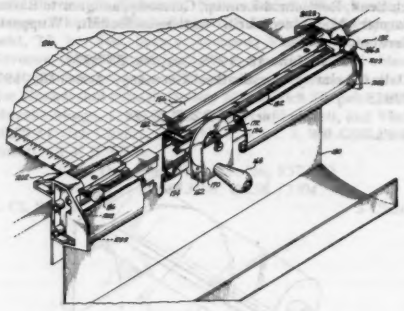
3,958,477

FLAT STOCK CUTTER

Richard L. Carlson, 3601 Lemon Tree Lane, Auburn, Wash. 98002

Continuation-in-part of Ser. No. 256,908, May 25, 1972, Pat. No. 3,823,635. This application July 12, 1974, Ser. No. 488,231
The portion of the term of this patent subsequent to July 16, 1991, has been disclaimed.
Int. Cl.[2] B26D 1/20
U.S. Cl. 83—167 20 Claims

1. A cutter assembly for cutting flat stock materials comprising: a cutter bar located such that material to be cut positions under the cutter bar allowing a view of the exact line to be cut; a track located below the bar; a carriage moveably mounted in the track; a freely rotatable cutter wheel mounted to the carriage with a side of the wheel in contact with the face of the cutter bar, said cutter wheel of a width to push away an operator's hand placed against the cutter bar without cutting the operator; means for urging the cutter wheel against the cutter bar; and a handle mounted to the carriage to allow moving the carriage such that the mounted cutter wheel



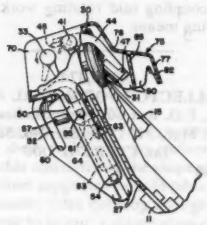
moves along the face of the cutter bar to cut the flat stock material.

3,958,478

SHARPENER FOR COMMODITY SLICING MACHINE

William John Camper, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Sept. 3, 1974, Ser. No. 502,799
Int. Cl.[2] B26D 7/12
U.S. Cl. 83—174 12 Claims



1. In a commodity slicing machine, including a rotatable circular knife having a cutting edge, means for rotating the knife, knife sharpening means including dressing members engageable with the knife at the cutting edge for sharpening the edge, means for supporting the dressing members on the knife sharpening means, and guard means cooperating with the knife to expose a first part of the knife cutting edge in an active cutting area, to expose a second part of the knife cutting edge in a sharpening area, and to surround and protect the remaining parts of the knife cutting edge in an inactive area, the improvement comprising:

a. guide means mounting the knife sharpening means adjacent the sharpening area for movement between a sharpening position wherein the dressing members straddle the knife edge and a retracted storage position removed from the knife edge, and

b. a guard cover for the knife sharpening means and the exposed knife cutting edge thereadjacent, said cover having a guarding section which includes a first portion on one side of said dressing member supporting means substantially straddling the cutting edge in the sharpening position, and a second portion located adjacent said first portion on the same side of said dressing member supporting means and substantially straddling the cutting edge in said storage position, said guarding section at all times in and between the sharpening and storage posi-

tions extending substantially over and protecting the second part of the knife cutting edge in the sharpening area.

3,958,479

MACHINE TOOL HAVING OPERATION CONTROL

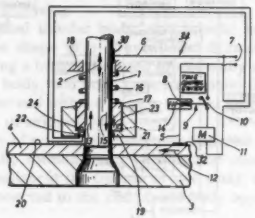
Berthold Leibinger, Gerlingen, Germany, assignor to Firma Trumpf Maschinen A.G., Switzerland

Filed Jan. 24, 1975, Ser. No. 543,938

Claims priority, application Germany, Jan. 31, 1974, 2404485

Int. Cl.² B23D *27/00*; B26D *5/20*

U.S. Cl. 83—209 **8 Claims**



1. A machine operable on a workpiece which is electrically conductive, particularly a stamping, nibbling and similar machine, comprising a movable electrically conductive tool which is movable into and out of engagement with a workpiece, an electrical control circuit for said tool including a relay having a normally closed contact, means biasing said normally closed contact to a closed position, said circuit having first and second spaced apart contact terminals, said first contact terminal being engaged with said work tool, said second contact terminal being engaged with the workpiece, said relay being energized by completion of said circuit by engagement of the workpiece with the tool to open said normally closed contact, and a control device in said electric circuit for starting and stopping a control operation during the closing and opening of said contact.

3,958,480

LONGITUDINAL SHEAR

Wolfgang Rohde, Hilchenbach-Dahlbruch; Friedrich Rotter, Kreuztal-Kredenbach, and Adolf Müller, Hilchenbach-Allenbach, all of Germany, assignors to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

Filed Aug. 5, 1974, Ser. No. 494,608

Claims priority, application Germany, Aug. 9, 1973, 2340273; Aug. 9, 1973, 2340340

Int. Cl.² B23D *15/04*, *15/08*

U.S. Cl. 83—237 **16 Claims**

1. A shear for rolled sheet, comprising

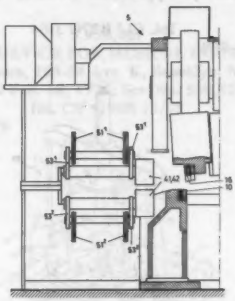
a. a housing having an entrance and an exit, the sheet moving longitudinally and horizontally through the housing from the entrance to the exit,

b. a blade mounted in the housing and located longitudinally thereof, the blade being vertically movable in a plane perpendicular to the sheet to divide the sheet into two strips by means of successive partial cuts determined by the length of the blade,

c. a pair of holding rollers mounted within the housing with their axes extending transversely to maintain the sheet in a fixed position during each cutting stroke, each roller being located closely adjacent the blade, the two holding rollers being located one behind the other in the direction of sheet movement, and

d. a first driver with actuating and adjusting mechanisms mounted outside the housing adjacent the entrance, and

e. a second driver with actuating and adjusting mechanisms mounted outside the housing adjacent the exit, characterized by the fact that an upper and a lower holding roller



of the pair of molding rollers (**41, 42**) is each located on common balancing pieces (**53¹, 53²**) which are suspended from each transverse member (**51¹, 52²**), so that they are able to oscillate.

3,958,481

APPARATUS FOR CUTTING A MOVING OBJECT INTO A PREDETERMINED LENGTH

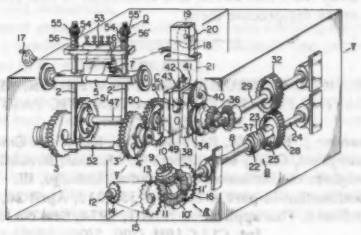
Mamoru Arai, Gifu, Japan, assignor to Eisai Co., Ltd., Tokyo, Japan

Filed July 10, 1975, Ser. No. 594,650

Claims priority, application Japan, July 20, 1974, 49-83343

Int. Cl.² B26D *1/56*

U.S. Cl. 83—311 **3 Claims**

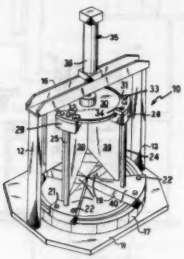


1. An apparatus for cutting a moving object into pieces of a predetermined length, comprising: a frame; a lower cutter base member which is transversely supported on said frame in a rotatable fashion and is provided with vertical holes running therethrough; an upper cutter base member which is disposed above said lower cutter base member at a specified distance and is supported on the upper part of rods which make vertical movement via said holes running through the lower cutter base member; a pair of upper and lower cutter members which are respectively installed on the upper and lower cutter base members and are disposed confronting each other so as to cooperate in cutting the object; a crank disc member which is vertically supported on said frame in a rotatable fashion and the lower ends of said rods are pivotally connected to eccentric positions thereon; and a driving mechanism for rotating said crank disc member.

3,958,482
MACHINE FOR CUTTING MATERIAL

Knut Hjalmar Claesson, Overlida, Sweden, assignor to Nordisk Kartro Aktiebolag, Sweden

Filed Apr. 15, 1975, Ser. No. 568,305
Claims priority, application Sweden, Oct. 16, 1974, 7413058
Int. Cl.² B27G 5/04
U.S. Cl. 83—559 **5 Claims**



1. A cut-off machine, comprising:

a. a ring member;

b. at least two anvils, each of which is separately securable to said ring member in an angularly adjustable position about a common axis;

c. a plurality of journal columns respectively secured to said anvils and extending parallel to said axis, and respectively positionable with each said anvil in said angularly adjustable position;

d. a plurality of knife holders respectively slidably carried on said journal columns;

e. a plurality of knives respectively secured to said knife holders and coactive with that one of said anvils to which its said journal column is secured, for simultaneously cutting action; and

f. a circular press plate adapted to be driven toward and away from said anvils, and connected to said knife holders to reciprocate them.

3,958,483
MUSICAL INSTRUMENT RHYTHM PROGRAMMER HAVING PROVISION FOR AUTOMATIC PATTERN VARIATION

Alexander J. Borrevik, Babylon, N.Y.; Robert B. Cotton, Jr., Sunnyvale, Calif., and Robert G. Mathias, Brookfield, Ill., assignors to Hammond Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 352,912, April 20, 1973, abandoned. This application Nov. 1, 1974, Ser. No. 519,872
Int. Cl.² G10H 1/00, 5/00
U.S. Cl. 84—1.03 **16 Claims**

1. In an automatic rhythm system, in combination:

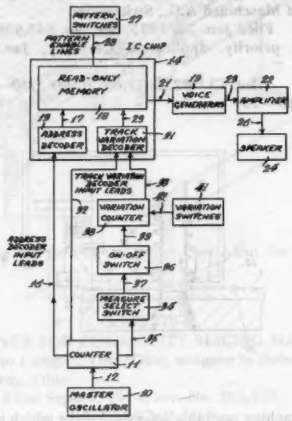
memory circuit means having a set of input address lines and a set of output signal lines;

first address circuit means for producing a repetitive sequence of pulses, one-at-a-time, on individual ones of a first subset of said input address lines at a preselected first rate associated with subintervals of a musical measure;

second address circuit means for producing a sequence of pulses, one-at-a-time, on individual ones of a second subset of said input address lines at a second rate programmable to be at least one of a series of different subintervals of a musical measure and a series of different multiples of a musical measure; and

third address circuit means, including a plurality of manually operable controls each producing an enabling signal on a unique one of a third subset of said input address lines;

said memory circuit means being preprogrammed to respond to at least one of said enabling signals and to said pulses on said first and second subsets of said input address lines to produce differing sequences of output pulses on at least one subset of said output signal lines

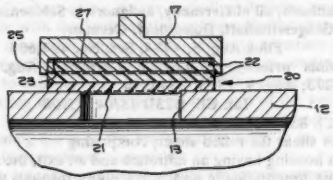


associated with said enabling signal, said sequences of output pulses on each subset of said output signal lines being characteristic of an associated basic type of rhythm pattern with variations in each such pattern at said second rate.

3,958,484
SEALING MEANS FOR WIND INSTRUMENTS

Robert E. Nelson, and Robert D. Gilbert, both of Los Angeles, Calif., assignors to Roberts' Products, Inc., Los Angeles, Calif.

Filed May 29, 1975, Ser. No. 581,852
Int. Cl.² G10D 7/00
U.S. Cl. 84—380 R **15 Claims**



1. In sealing means for a wind instrument having a plurality of spaced holes normaly closed by key cups having pads thereon sealing off the holes with respect to the atmosphere, the improvement which comprises:

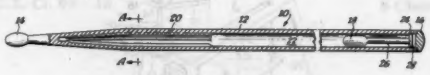
said pads being comprised of a first layer of a relatively soft, closed-cell, cross-linked polyethylene foam material bonded to a second layer of a closed-cell polyethylene foam material of a rigidity greater than said first layer, a portion of said first layer entering one of said holes when said one of said holes is normally closed by one of said key cups.

3,958,485

DRUMSTICK

Thomas O. Peters, 2730 NE. 30th Ave., Lighthouse Point, Fla. 33064

Filed July 7, 1975, Ser. No. 593,279
Int. Cl.² G10D 13/00
U.S. Cl. 84—422 S 4 Claims



1. An improved drumstick consisting of a thermoplastic material and a reinforcing agent of substantially unitary construction comprising:

an elongated tubular body, said tubular body having the exterior shape of a conventional drumstick, said body including a hollow disposed substantially along the length of said body, said body including a solid tip portion adjacent one end with a conically tapered portion towards the middle of said body;

a plurality of raised, longitudinally disposed reinforcing ribs integrally formed along the interior chamber wall disposed adjacent the tip end of said body; and

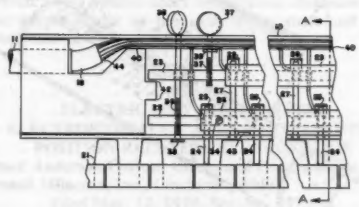
a cap connected to the end of said body opposite said body tip.

3,958,486

KEYBOARD ATTACHMENTS

Gustavus Warren Sears, 11402 Allview Drive, Beltsville, Md. 20705

Filed Sept. 18, 1974, Ser. No. 507,370
Int. Cl.² A63J 17/00
U.S. Cl. 84—464 4 Claims



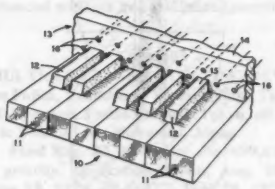
1. In a visual display device for visually representing the operation of keys on a keyboard musical instrument, a switch means sensing the movement of said keys and controlling the visual representation of that movement by said display device comprising a housing extending across a plurality of keys on said keyboard, said housing having a substantially vertical face panel, means for mounting said housing above the keyboard, a first set of plungers extending from within said housing and resting on the white keys of said keyboard and a second set of plungers extending from within said housing and resting on the black keys of said keyboard, first and second support blocks extending longitudinally within said housing, each of said support blocks being provided with a plurality of apertures for slidably receiving one of said plungers, a first set of contacts being carried by said first support block and a second set of contacts carried by said second support block, said first support block supporting said white key plungers in operative relationship with said first set of contacts such that upon depression of a particular white key a signal is sent to said display for visually representing the depression of said particular white key, said second support block supporting said black key plungers in operative relationship with said second set of contacts such that upon depression of a particular black key a signal is sent to said display for visually representing the depression of said particular black key, and means for adjustably supporting each of said first and second support blocks within said housing.

3,958,487

TEACHING DEVICE FOR MUSICAL INSTRUMENTS

Abraham Goldman, 105-54 Ave. K, Brooklyn, N.Y. 11236

Filed Feb. 18, 1975, Ser. No. 550,822
Int. Cl.² G09B 15/08
U.S. Cl. 84—478 2 Claims



1. A teaching device for use with a musical instrument having a plurality of keys comprising:

an indicating means for indicating sequentially the keys of said instrument to be actuated,

said indicating means including a mount which is independant of the musical instrument,

a plurality of separate light emitting elements respectively disposed in said mount adjacent the corresponding keys of said instrument,

a control means for activating said light emitting elements in a predetermined sequence to indicate the particular keys to be actuated,

said controll means including a housing remotely disposed relative to said mount,

a light bulb comprising a constant light source for illumination disposed in said housing,

a plurality of light receiving elements disposed in light transmitting relationship with respect to said light bulb,

an elongated fiber optic bundle interconnecting each of said light receiving elements with a corresponding light emitting element,

a programming means,

said programming means including a sheet of material having a series of light transmitting openings disposed in a predetermined pattern thereon,

said light transmitting opening being disposed in alignment with said light receiving elements,

drive means for imparting movement of said sheet through said housing between said light bulb and said light receiving elements whereby light from said light bulb is transmitted through said openings to said light receiving element when said opening is passing in alignment with said light receiving element whereby said light is directly transmitted to said light emitting element via said connecting bundle of fiber optics,

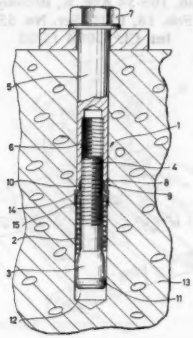
said drive means comprising a pair of drive rollers,

and a motor means for driving one of said rollers; said driving means being actuated independently of of the musical instrument.

3,958,488
EXPANSIBLE ANCHOR

Artur Fischer, Altheimer Strasse 219, D-7241 Tumlingen, Germany

Filed June 11, 1974, Ser. No. 478,396
Claims priority, application Germany, June 15, 1973, 2330538; June 23, 1973, 2332107
Int. Cl.² F16B 13/06
U.S. Cl. 85—77 8 Claims



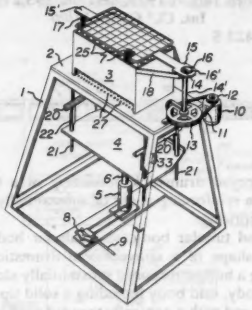
1. An expansible anchor for use in mounting an object in an anchoring hole of a support structure, comprising an expander member having a screw-threaded trailing shaft portion and a leading expander portion diverging forwardly from the same; an expansion sleeve slidably surrounding said shaft portion over part of the length thereof and having a trailing end constituted of metallic material; an actuating member having a front annular end face constituted of metallic material; and a tapped bore into which said shaft portion is threaded, and which extends rearwardly from said front annular end face; and a cap formed of synthetic plastic material having a skirt portion of an outside diameter larger than the diameter of said trailing end of said sleeve so as to surround the latter, and a confined transverse portion extending inwardly of said skirt and surrounding said shaft portion, said transverse portion being located intermediate said metallic material trailing end of said expansion sleeve and said metallic material front annular end face of said actuating member so as to prevent metal-to-metal contact therewith so that, on requisite turning of said actuating member, said front annular end face bears against said transverse portion and via the same upon said trailing end of said expansion sleeve to effect relative movement of the same and of said expander member, thereby resulting in entry of said leading expander portion into said sleeve and consequent expansion of the same.

3,958,489
MACHINE FOR USE IN MAKING TOY SPARKLERS

Katuhiko Inoue, Shimada, Japan, assignor to Inoue Toy-Fireworks Company Limited, Shimadi, Japan

Filed Mar. 3, 1975, Ser. No. 554,732
Claims priority, application Japan, Mar. 9, 1974, 49-27477
Int. Cl.² C06B 21/00; F42B 4/20
U.S. Cl. 86—20 V 7 Claims

1. A machine for use in making toy sparklers comprising a machine frame having a tabletop, a casing disposed on said tabletop, partitions dividing said casing into a plurality of subdivisions in which sparkler sticks are disposed, frame means having a plurality of subdivisions mounted above said casing, vibrating means operatively connected to said frame means for vibrating the latter, said tabletop having a plurality of depressions with a through hole being located centrally of each depression, each of said holes being of a size to accommodate one stick, said tabletop having a raised edge surrounding each of said holes, a receiving plate located below said tabletop and arranged such that the sticks passing through said holes have their bottom ends abutting said receiving plate,

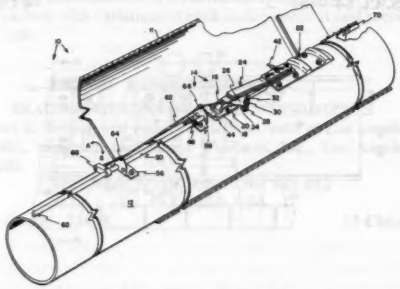


support means disposed above said receiving plate and adapted to accommodate an insertion plate in which said sparkler sticks are inserted, and operable means to raise and lower said receiving plate and said insertion plate.

3,958,490
SELF-COCKING ROCKET LAUNCHER DETENT

Wayne G. Zellmer, and Marvin E. McGowan, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 19, 1974, Ser. No. 534,383
Int. Cl.² F41F 3/04
U.S. Cl. 89—1.807 4 Claims

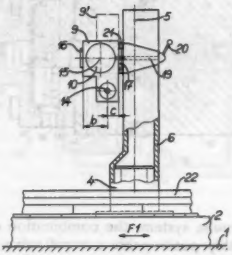


1. A missile launcher system including;
at least one launcher tube;
detent means intermediate the ends of said tube effective to hold a missile in place within said tube and to delay launch of said missile until a predetermined thrust has been exerted on said detent means by said missile;
manually operable means mounted on said tube and operatively connected with said detent means for selectively moving said detent means into and out of contact with said missile;
said manually operable means including means extending to a point near the forward end of said tube to facilitate access;
said detent means including a pawl pivotally mounted for movement between a first position ready for placement into contact with a missile to be launched and a second inoperative position effected by movement of the missile out of said tube; and
reset means operatively associated with said manually operable means effective to move said pawl to a RESET position.

3,958,491
MACHINE TOOL

Robert Habib, 36, Quai Gustave Ador, 1200 Geneva, Switzerland

Filed Aug. 16, 1974, Ser. No. 498,127
Claims priority, application Switzerland, Sept. 11, 1973, 13011/73; Nov. 19, 1973, 16223/73
Int. Cl.² B23C 1/12; B24B 7/00
U.S. Cl. 90—16 8 Claims

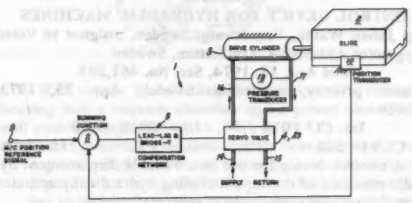


1. A machine tool comprising: a working table and a vertical column movable relative to one another horizontally and vertically; a tool-carrying head including a shaft having first and second ends, means at each of said first and second ends of the shaft for mounting a tool, and motor means for driving the shaft, the tool-carrying head having two opposed outer faces parallel to the shaft; and means for removably securing the tool-carrying head on the column in selected angular positions about a horizontal pivoting axis perpendicular to said opposed faces with either of said opposed faces facing a cooperating face of the column, said first and second ends of the shaft being spaced apart by different distances from a plane perpendicular to the axis of the shaft and passing through said pivoting axis.

3,958,492
ELECTRICALLY COMPENSATED ELECTROHYDRAULIC SERVO SYSTEM WITH POSITION RELATED FEEDBACK LOOP

Richard Anderson Curless, Cincinnati, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Mar. 12, 1975, Ser. No. 557,596
Int. Cl.² F15B 9/03, 9/09
U.S. Cl. 91—363 R 9 Claims



1. An electrically compensated electrohydraulic position control servosystem having a negative position feedback loop for controllably positioning a drive means said system comprising:

a bridged-T network;

a source of a reference signal;

a summing junction connected between said source and said bridged-T to provide an error signal as an input signal to said bridged-T;

a dynamic pressure feedback servovalve assembly comprising a servovalve having as an output a pair of hydraulic lines for connection to said drive means as supply and return lines thereof, a differential pressure transducer connected as a feedback loop between said lines in pressure communcation with the hydraulic flow area within each such line, and electric power means to position said servovalve;

a lead-lag network connected between said bridged-T and said power means; and

a position transducer connected in said position feedback loop between the output from said drive means and said summing junction; and

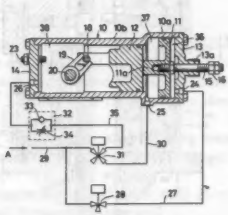
means for delivering a control signal from the output of said lead-lag network to said servovalve assembly;

whereby position reference signals from said source position said drive means in a lowly damped low gain system of enhanced stiffness and minimized overshoot.

3,958,493
MULTIPLE-STAGE ACTUATING DEVICE

Tomomitsu Fujita, Yokohama; Yoshiaki Imai, Tokyo; Masaaki Ohno, Tokyo, and Toshio Ohyagi, Tokyo, all of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Aug. 20, 1974, Ser. No. 499,013
Claims priority, application Japan, Aug. 20, 1973, 48-93112; June 18, 1974, 49-68672; June 18, 1974, 49-68674; July 5, 1974, 49-76408; July 5, 1974, 49-76409
Int. Cl.² F15B 11/14
U.S. Cl. 91—411 R 4 Claims



1. An actuating device comprising: a cylinder having a cylinder body of hollow cylindrical form and end parts covering two ends of the hollow interior of said cylinder body; a first and a second pistons fitted slidably within the cylinder body in spaced apart relation in the axial direction thereof, said pistons being respectively slidable separately in apart relation and unitarily in mutual contact relation in said axial direction; a first, a second and a third ports provided at the cylinder,

said first port communicating a chamber defined between the first piston and the end part of the cylinder, said second port communicating a chamber defined between the first and second pistons, and said third port communicating a chamber defined between the second piston and the end part of the cylinder; stopper means for limiting the strokes in sliding motions of the first and second pistons respectively at different displacement positions; a driven structure coupled to the second piston and driven responsive to the sliding motion of the second piston; and control means for controlling the supply and discharge of a working fluid to and from the first through third ports, said control means supplying the working fluid into the first chamber whereby the first and second pistons are moved unitarily in contact relation in one axial direction from an initial position to a first stage position where the first piston is stopped by the stopper means, thereafter supplying the working fluid into the second chamber and discharging the working fluid from the third chamber whereby only the second piston is moved in one axial direction from the first stage position to a second stage

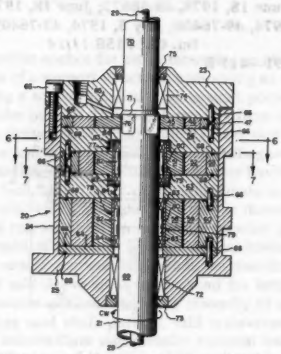
position where the second piston is stopped by the stopper means, supplying the working fluid into the third chamber and discharging the working fluid from the second chamber whereby only the second piston is moved in opposite axial direction from the second stage position to the first stage position where the second piston is stopped by the first piston, and said control means thereafter supplying the working fluid into the second chamber and discharging the working fluid from the first chamber whereby the second and first pistons are moved unitarily in contact relation in opposite axial direction from the first stage position to the initial position where the first piston is stopped by the stopper means.

3,958,494

MULTIPLE DISPLACEMENT HYDRAULIC MOTOR DRIVE APPARATUS

Franklin G. Miller, Orchard Park, N.Y., assignor to Moog Inc., East Aurora, N.Y.

Filed Sept. 30, 1974, Ser. No. 510,802
Int. Cl.² F15B *11/00*, *13/00*; B23B *39/08*
U.S. Cl. 91—411 A **5 Claims**



1. Variable speed drive apparatus for a shaft, comprising a first constant displacement rotary hydraulic motor drivingly associated with said shaft, at least one additional constant displacement rotary hydraulic motor drivingly associated with said shaft, overrunning clutch means operatively interposed between each such additional motor and said shaft, and single valve means arranged to meter the flow of hydraulic drive fluid to said motors to control their speed.

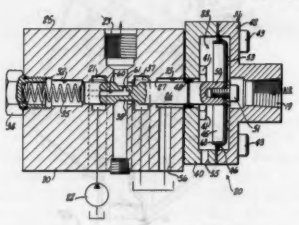
5. Variable speed drive apparatus for a shaft, comprising a plurality of constant displacement rotary hydraulic motors drivingly associated with said shaft, a first of said motors having a relatively high constant displacement, a second of said motors having a relatively lower constant displacement and a third of said motors having a relatively lowest constant displacement, single valve means arranged to meter the flow of hydraulic drive fluid to said motors to control their speed, a first blocking valve associated with said first motor, and a second blocking valve associated with said second motor, each of said first and second blocking valves being operative to communicatively connect its corresponding one of said first and second motors to said single valve means during a low range of rotative speed of said shaft, but only said second blocking valve being so operative during an intermediate speed range, and neither of said blocking valves being so operative during a high speed range.

3,958,495

AIR-OIL AMPLIFIER

Gerald W. Bernhoft, Milwaukee, Wis., assignor to Koehring Company, Milwaukee, Wis.

Division of Ser. No. 285,543, Aug. 31, 1972, abandoned. This application Sept. 19, 1973, Ser. No. 398,757
Int. Cl.² F16K *11/00*; G05D *16/06*
U.S. Cl. 91—433 **1 Claim**



1. In a hydraulic system, the combination of: a hydraulic motor, a variably positionable control valve having a fluid actuating chamber and adapted to control flow to said hydraulic motor in relation to the pressure developed in said chamber; means providing a source of pilot air pressure at selectable pressures in a first range; means providing a source of oil; an amplifier means having a housing forming a bore therein, a valve spool slideable in said bore, said housing having an outlet port communicating with said actuating chamber of said control valve, first and second inlet ports respectively connected with said source of pilot air pressure and said source of oil, said spool forming first and second chambers in said bore at opposite ends of said valve spool, means including an axial passage in said spool continuously communicating said second chamber with said outlet port, said spool forming a first pressure responsive surface subject to the pressure at said outlet port communicated through said axial passage to urge said spool in one direction, said valve spool forming a second presssure responsive surface in said first chamber, said second pressure responsive surface being larger than said first pressure responsive surface, said first chamber being in communication with said source of pilot air pressure at selectable pressures for urging said spool in a direction to communicate said inlet port to said actuating chamber to supply oil from said source of oil to said actuating chamber at a pressure in a second range, the pressures in said second range being substantially higher than the pressure in said first range and in direct proportion to the latter for all positions of said spool.

3,958,496

CONTROL DEVICE FOR HYDRAULIC MACHINES

Bengt Johan Wallin, Vanersborg, Sweden, assignor to Volvo Flygmotor Aktiebolag, Trollhattan, Sweden

Filed Apr. 15, 1974, Ser. No. 461,203
Claims priority, application Sweden, Apr. 25, 1973, 7305829
Int. Cl.² F01B *3/00*, *13/04*; F04B *49/00*
U.S. Cl. 91—506 **10 Claims**

1. A control device for use in a variable displacement hydraulic machine of the type including hydraulically actuated means for varying said displacement, comprising:

a member movable by said hydraulically actuated means in response to changes in said displacement;

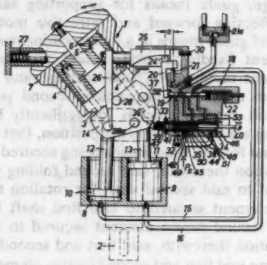
movable pivot means resiliently biased to contact said movable member for movement in response thereto;

resiliently biased valve means for controlling fluid flow to said hydraulically actuated means;

means mounted for movement in said machine in response to the working pressure thereof;

lever means slidably contacting said movable pivot means and adapted for pivotal motion thereabout, said lever

means being pivoted in response to forces received from said spring biased valve means and said pressure responsive means, whereby said lever means pivots about said pivot means to actuate said spring biased valve means in response to movement of said pressure responsive means due to said working pressure; and



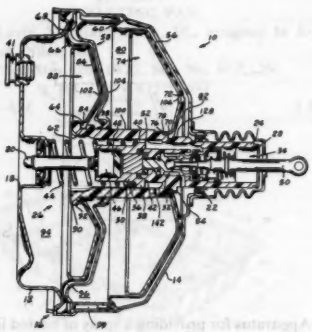
adjustable means for restricting movement of said pivot means along said lever means to vary the effective lever arms for said valve means and said pressure responsive means.

3,958,497

WALL MEANS FOR A SERVOMOTOR

Delbert J. Gardner, and Maxwell L. Cripe, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Division of Ser. No. 383,931, July 30, 1973, Pat. No. 3,897,718. This application Dec. 20, 1974, Ser. No. 534,611
Int. Cl.² F01B *19/00*
U.S. Cl. 92—48 **7 Claims**



1. Wall means for dividing the interior of a servomotor housing into a vacuum chamber and a power chamber, said wall means comprising:

hub means having a stepped interior bore therein for retaining an operational control valve responsive to an operator input for actuating the servomotor, said hub means having an external periphery, a first shoulder on said external periphery and a first groove on said external periphery; a first annular ledge located between said first shoulder and said first groove;

first diaphragm means having an outer periphery secured to the housing of the servomotor, a first bead on the inner periphery of said first diaphragm means located in the first groove in the hub means to establish said vacuum chamber and said power chamber; and

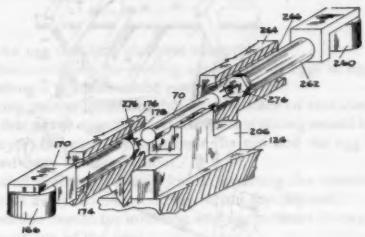
first backing plate means having an outer diameter free to move from the power chamber toward the vacuum chamber, a first sleeve on the inner diameter of said first backing plate located on said first ledge, said first sleeve having a width substantially equal to said first ledge and said first groove, said first sleeve radially compressing said first bead into the groove to form together with said hub means a first fluid seal between the vacuum chamber and the power chamber, said first diaphragm means urging the first sleeve into abutting engagement with said first shoulder to prevent relative movement between the hub means and the first backing plate means.

3,958,498

METHOD AND APPARATUS FOR FORMING CIGARETTE FILTERS

Leslie E. Payne, 3423 Luther St., Winston-Salem, N.C. 27107

Filed Jan. 18, 1974, Ser. No. 434,747
Int. Cl.² A24C *5/50*
U.S. Cl. 93—1 C **12 Claims**



1. An apparatus for forming filters comprising:

a. means for receiving and holding a plurality of filters;

b. forming means associated with said receiving and holding means for forming said filters into a desired configuration;

c. means for manipulating said forming means so that said forming means will sequentially engage and disengage said filters;

d. heater means associated with said forming means for heating said forming means; and

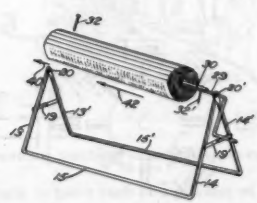
e. means for sensing the temperature for said forming means so that the heater means may be regulated to maintain the forming means at a selected temperature.

3,958,499

NEWSPAPER LOG MAKER

Percy Frederick Albee, Jr., Barrington, R.I., assignor to Q-Panel Corporation, Providence, R.I.

Filed Jan. 6, 1975, Ser. No. 538,595
Int. Cl.² B31C *13/00*; C10L *5/40*
U.S. Cl. 93—1 C **3 Claims**



1. A device for rolling newspapers and the like comprising a pair of vertical standards having circular bearings at the upper ends, a crank arm having a main shank portion extending through each of said bearings, a clamp bar, removable means to removably secure said clamp bar on the shank por-

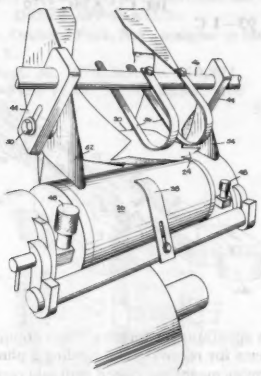
tion of said crank arm to clamp material to the shank portion and to rotate therewith whereby the shank may be first fully loaded with all paper to be rolled and the clamp bar then used to clamp the paper to the shank and upon completion of rolling said removable means may be removed and the rolled paper may be axially moved off the shank.

3,958,500

BOTTOM FORMING DEVICE FOR A BAG FORMING MACHINE

John W. Williams, Jacksonville, Fla., assignor to Terminal Paper Bag. Co., Yulee, Fla.

Filed Oct. 25, 1974, Ser. No. 518,189
Int. Cl.² B31B *1/36*
U.S. Cl. 93—27 **8 Claims**



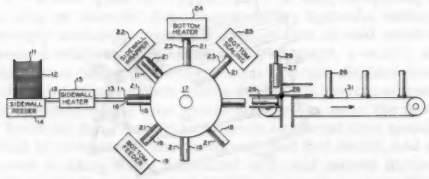
1. A bottom forming device for a bag forming machine comprising a pair of bottom formers, each bottom former being of plate-like construction and having, with respect to the path of travel of a bag bottom during the forming thereof, a vertical side portion and a horizontal top portion connected along a fold line, said horizontal top portion having an inner edge which has an elongated portion extending inwardly and rearwardly, said vertical side portion extending a substantial distance forwardly of said horizontal top portion.

3,958,501

APPARATUS FOR FORMING A CONVOLUTED CONTAINER SIDEWALL

Frank P. Richards, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 18, 1974, Ser. No. 515,872
Int. Cl.² B31B *1/32*
U.S. Cl. 93—39 C **16 Claims**



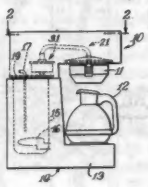
1. Apparatus for wrapping a blank about a mandrel to form a convoluted tubular sidewall, which comprises a mandrel, a clamping means associated with said mandrel to hold an intermediate portion of a blank therebetween, first and second folding wing means positioned to contact the outer surface of the thus held blank on opposite sides of said clamping means, means for rotating said first and second folding wing means about the axis of said mandrel to wrap the blank about said mandrel and for terminating the rotation of said second folding wing means about said axis before the opposite side margins of the blank are overlapped by the continued rotation of said first folding wing means about said axis, and means for sealing the thus overlapped side margins to thereby form a convoluted tubular sidewall; said means for rotating comprising a carriage, guide means for supporting said carriage, means for effecting forward and retractive motion of said carriage in said guide means in a reciprocating manner, a first driving element fixedly secured to said carriage, a second driving element mounted on said carriage and adapted to move between a first position and a second position with respect to said carriage, means for resiliently biasing said second driving element to said first position, first and second shafts, said first folding wing means being secured to said first shaft for rotation therewith, said second folding wing means being secured to said second shaft for rotation therewith, a first driven element secured to said first shaft for rotation therewith, a second driven element secured to said second shaft for rotation therewith, said first and second driven elements engaging said first and second driving elements, respectively, and stop means for terminating the movement of said second driving element during the final portion of the forward motion of said carriage so that the continued motion of said carriage with respect to said second driving element places said second driving element in said second position.

3,958,502

BEVERAGE BREWER

Charles J. Vitous, Berwyn, Ill., assignor to Cory Food Services, Inc., Chicago, Ill.

Filed May 16, 1975, Ser. No. 578,204
Int. Cl.² A47J *31/00*
U.S. Cl. 99—300 **23 Claims**



1. Apparatus for providing a spray of heated liquid comprising:

a tank;

means for delivering liquid into said tank;

means for heating liquid in said tank;

duct means for conducting heated liquid from said tank to an outlet as an incident of delivery of liquid into said tank by said liquid delivering means;

means defining a vented reservoir superjacent the tank;

aspirator means responsive to the flow of said heated liquid for withdrawing liquid from said reservoir to provide an expansion space in said reservoir for receiving liquid subsequently expanded from said tank thereinto as a result of heating of the liquid delivered to said tank by said delivery means; and

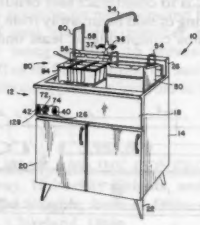
baffle means spaced adjacent said duct outlet for impingement of the conducted heated liquid thereagainst to cause delivery of the heated liquid therefrom in the form of a spray.

3,958,503

SPAGHETTI COOKING SYSTEM

L. Frank Moore, Shreveport, La., assignor to The Frymaster Corporation, Shreveport, La.

Filed May 3, 1974, Ser. No. 466,530
Int. Cl.² A47J 27/62
U.S. Cl. 99—327 19 Claims



1. Pasta cooking apparatus for cooking, storing and reconstituting pasta comprising:

a housing having adjacent first and second basins, means for supplying water to said first and second basins and means for heating the water in said first basin to cook said pasta;

means for cooking said pasta in the heated water of said first basin for a predetermined period of time;

means for storing said cooked pasta in cold water in said second basin, including means for containing said cooked pasta in individual servings in said second basin; and

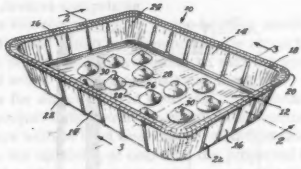
means for reconstituting said cooked pasta in said first basin in said individual servings.

3,958,504

ROASTING PAN

Myron M. Levin, Highland Park, Ill., assignor to E-Z Por Corporation, Niles, Ill.

Filed Mar. 26, 1975, Ser. No. 562,229
Int. Cl.² A47J 27/00
U.S. Cl. 99—426 3 Claims



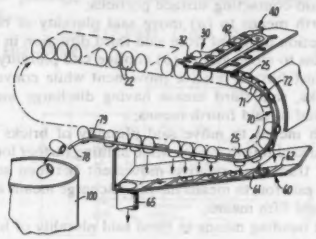
1. A roasting pan integrally formed of an aluminum foil material and comprising a flat bottom and upstanding side and end walls, said bottom having a plurality of spaced upwardly extending convexo-concavo projections or embossings formed therein having a rounded top portion on which a food product to be roasted rests when positioned in said pan so that the roasting product has minimal surface contact with the surface on which it rests and is elevated and spaced from the flat bottom to permit the juices and/or grease from the roasting product to collect on the bottom of the pan and flow freely on said bottom, the rounded top portions of said plurality of projections being on the same horizontal plane, said projections maintaining the roasting product out of contact with the juices and/or greases in the pan.

3,958,505

EGG CRACKING MACHINE

Lamar Baker, 323 Harkness Ave., San Francisco, Calif. 94134

Filed Nov. 21, 1974, Ser. No. 525,763
Int. Cl.² A23J 1/00
U.S. Cl. 99—495 2 Claims



1. An egg cracking machine comprising:

a first conveyor for moving a plurality of eggs in egg flats along a predetermined path,

slicing means mounted above the surface of said conveyor such that as the eggs are carried past said slicing means by said conveyor, the eggs are split near the top and the egg top is severed from the egg bottom,

second conveyor means for transporting the severed egg tops away from said slicing means for disposal,

inversion means for inverting said egg bottoms to empty the contents of the eggs,

collector means for receiving the contents of the eggs, and

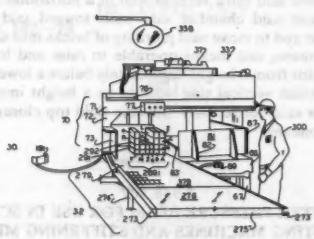
guide means for preventing the egg shells from falling into said collector means as the eggs are inverted, said guide means comprising a stationary rail mounted slightly away from the upper surface of said severed egg bottoms and against which said severed egg bottoms slide as they are inverted.

3,958,506

APPARATUS FOR PACKAGING CONCRETE BRICK

Thomas R. Salts, Amarillo, Tex., assignor to Crowe-Gulde, Inc., Amarillo, Tex.

Filed May 21, 1974, Ser. No. 471,857
Int. Cl.² B65B 13/18
U.S. Cl. 100—4 3 Claims



1. Brick handling machinery comprising, in operative combination

1. first means to move each of a plurality of bricks with a contacting surface portions therebetween in one plane relative to each other in directions parallel to said contacting surface portions and to translate all of said bricks in one direction;

2. second means to move each of said plurality of bricks with contacting surface portions in a second direction at an angle to said one direction and relative to each other

in directions parallel to the plane of said contacting portions, said first means having discharge means connected to said second means;

3. third means to move each of said bricks in a third direction transversely to said second direction and to move each of said bricks having contacting surface portions relative to each other in a direction parallel to the plane of said contacting surface portions;

4. fourth means to (*a*) move said plurality of bricks in a direction different from said third direction in said third means to move and to (*b*) confine said plurality of bricks against further relative movement while conveying said bricks, said third means having discharge means connected to said fourth means;

5. fifth means to move said plurality of bricks vertically from said fourth means while limiting further longitudinal and transverse relative movement between said bricks and said fourth means having discharge means connected to said fifth means;

6. and banding means to band said plurality of bricks; and wherein-

7. said first means to move said bricks is a conveying and vibrating means for conveying said bricks in one horizontal direction and vibrating said bricks in a plane normal to said one direction,

and said second means is a flat horizontal surface with a moving rigid flat vertical blade thereabove operable to move transversely to the length of said conveyor and parallel to said flat surface,

and said third means comprises a flat smooth horizontal surface with a moving rigid flat vertical blade thereover operable to move parallel to said surface and transversely to the length of said second means,

and wherein said fourth means is a horizontally extending movable elevator with a brick clamping means and is movably supported for longitudinal movement, said clamp means extending vertically and being movable from a lesser clamping spacing therebetween to a greater open distance therebetween,

and said fifth means comprises a chamber with a horizontally movable horizontally extending flat surfaced rigid top closure and a vertical movable elevator therebelow, and rigid vertical smooth-surfaced chamber side walls lateral to said elevator and spaced away from each other by a distance greater than the distance of said clamps in their clamping position and less than the distance of said clamps in their open position, said fifth means also comprising a third flat vertical rear rigid wall perpendicular to both of said side walls and operably connected to means to move said third vertical wall in a horizontal direction between said chamber side walls toward said banding means and to move said plurality of bricks into said banding means, and means operable to raise and lower said elevator from a height immediately below a lower edge of said third vertical side wall up to a height immediately below said horizontally movable rigid top closure of said fifth means.

3,958,507

COUNTER-PRESSURE BEAM FOR USE IN SCREEN PRINTING MACHINES AND STIFFENING MEANS THEREFOR

Mathias Mitter, Verl-Sende-Mitte, Germany, assignor to Mitter & Co., Schloss Holte, Germany

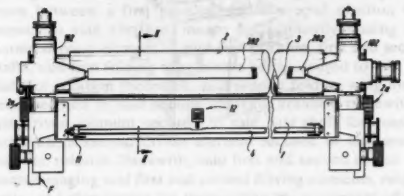
Filed June 19, 1974, Ser. No. 479,946

Claims priority, application Germany, June 20, 1973, 2331464

Int. Cl.² B41F *15/24*

U.S. Cl. 101—126 **18 Claims**

13. In a screen printing machine wherein a web of material to be printed moves lengthwise in a predetermined path, a combination comprising a driven endless liquid-permeable stencil adjacent one side of said path for contacting portions of the moving web with a liquid; an elongated counter-pressure beam extending transversely of said path at the other side thereof opposite said stencil, said beam being subject to bending stresses acting upon it in a region intermediate the ends of the beam so that the latter tends to flex away from said stencil, said beam including a first elongated portion adjacent to said path and a second elongated portion remote from said path and also having first and second elongated side faces; and counteracting means to counteract said bending stresses so as to prevent the flexing of said beam away from said stencil, said counteracting means comprising at least one elongated ten-



sioned tie rod, said tie rod being adjacent to one of said side faces and to said second portion of said beam and said counteracting means further comprising devices for securing the ends of said tie rod to said beam, said counteracting means also comprising means for controlling flexure of said tie rod intermediate said devices which results from tensioning of the tie rod, including a carrier secured to said one side face of said beam between said path and said tie rod and an abutment member adjustably secured to said carrier and extending toward an intermediate portion of said tie rod to thus limit the extent of flexing of said intermediate portion toward said path.

3,958,508

DEVICE FOR POSITIONING AN OBJECT TO BE PRINTED IN A PRINTING MACHINE

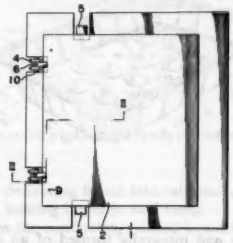
Yoshikuni Sakurai, Tokyo, Japan, assignor to Sakurai Seisakusho, Ltd., Mino, Japan

Filed Dec. 18, 1974, Ser. No. 533,939

Claims priority, application Japan, Aug. 22, 1974, 49-95561

Int. Cl.² B41F *1/36*

U.S. Cl. 101—407 BP **1 Claim**



1. A device for positioning an object containing prepunched locating holes and intended to be printed in a printing machine, said device comprising

a surface plate on which said object is placed,

front and side positioning members movable simultaneously longitudinally and transversely respectively of said surface plate for temporarily positioning said object on said surface plate in the longitudinal and the transverse directions,

positioning pins adapted to engage the prepunched locating holes in said object positioned on said surface plate,

and a clamping member provided on said front positioning member and movable into clamping engagement with said object substantially simultaneously with said front and side positioning members,

said positioning pins being adapted to fit into the locating holes in said object during printing and movable into said locating holes in timed relationship with and immediately subsequent to the longitudinal and transverse positioning movements respectively of said front and side positioning members and the clamping movement of said clamping member and said clamping member being adapted to prevent said object from lifting off of its final position on said surface plate while said positioning pins are inserted in the locating holes.

3,958,509

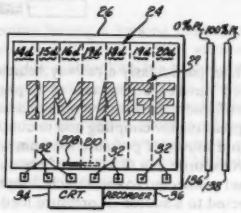
IMAGE SCAN AND INK CONTROL SYSTEM

James E. Murray, University Heights, and Algirdas J. Krygeris, Richmond Heights, both of Ohio, assignors to Harris Corporation, Cleveland, Ohio

Filed June 13, 1974, Ser. No. 478,927

Int. Cl.² B41C 7/08

U.S. Cl. 101—426 **33 Claims**



1. Apparatus for predetermining the settings of a plurality of ink control devices which control the amount of ink applied to respective circumferential zones of a printing cylinder for printing an image having ink zones where the ink supply rate of each zone is controlled by a respective one of said ink control devices comprising

means for supporting an image-bearing member having a first image which corresponds to the image to be printed and zones which correspond to said ink zones, each of said zones comprising sub-areas therein,

means for directing light onto said image-bearing member to project light therefrom which varies spatially in accordance with at least one zone of said first image,

means for receiving at one time the projected light from at least said one zone comprising camera means having a photosensitive area responsive to said projected light for producing separate electrical signals from sub-areas of said photosensitive area which vary in accordance with the light projected from respective ones of said sub-areas of said zone,

and means distinct from said photosensitive area and individually responsive to said separate electrical signals for establishing for each of said zones received by said camera means an individual resultant signal which has a characteristic indicating the approximate ink supply rate required for the zone and including means for approximately integrating signals derived from said separate electrical signals that are produced for the respective sub-areas of the zone,

whereby each of said individual resultant signals is indicative of a predetermined setting for one of the ink control devices.

3,958,510

ARRANGEMENT FOR VARIABLY ARMING A PROJECTILE AS IT EMERGES FROM A WEAPON BARREL

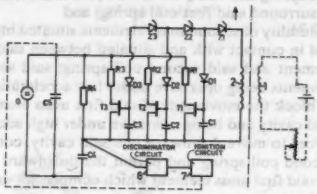
Dietmar Stutzle, Lauf, Germany, assignor to DIEHL, Nurnberg, Germany

Filed Apr. 3, 1974, Ser. No. 457,636

Claims priority, application Germany, Apr. 5, 1973, 2316976

Int. Cl.² F42C 11/04, 15/40

U.S. Cl. 102—70.2 G **20 Claims**



1. In combination with an arrangement for programming control circuitry for an electrically operated fuse of a projectile in which a first control coil on a muzzle of a weapon barrel through which the projectile passes develops a field which links a second receiving coil in the projectile and induces a voltage therein; the control circuitry in the projectile having a voltage sensitive igniter means, an ignition capacitor connected to said igniter means operable at a predetermined voltage to actuate said igniter means, a control capacitor, a charging circuit for said control capacitor operable to impart a predetermined charge thereto during travel of the projectile along the first control coil, a reload resistor connecting said control capacitor and said ignition capacitor in closed circuit for transfer of charge from the former to the latter, and charging means operable in response to said receiving coil passing through the field of said control coil to cause a precharge to build up on said ignition capacitor in conformity with the degree of energization of said control coil.

3,958,511

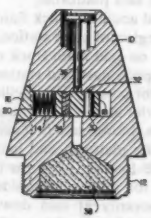
SETBACK LOCK APPARATUS

Warren P. Morrow, Silver Spring, Md., and Billy M. Horton, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 11, 1974, Ser. No. 478,203

Int. Cl.² F42C 15/29

U.S. Cl. 102—78 **6 Claims**



1. A setback lock apparatus for use with an ordnance missile fuze comprising:

a. a body having a planar top surface and a cavity extending in a generally downward direction into said body, said cavity having an opening at its top defined by the intersection of said cavity and said top planar surface and said cavity further being symmetrical about a linear axis perpendicular to said top planar surface;

b. a first coil spring situated within said cavity, said first coil spring being centered about said linear axis;
c. a first mass element situated in said cavity and in contact with said first coil spring, said first mass element being operative in a rest position to protrude through the opening at the top of said cavity and operative under accelerational forces to move downward into said cavity and compress said first coil spring;
d. a second coil spring situated within said cavity, said second coil spring being larger in diameter than said first coil spring and being centered about said linear axis so as to surround said first coil spring; and
e. a plurality of second mass elements situated in said cavity and in contact with and situated between said first mass element and said second coil spring; said second mass elements being operative under low accelerational forces to block the movement of said first mass element within said cavity and being operative under high accelerational forces to move downward into said cavity, compress said second coil spring and permit the downward movement of said first mass element which compresses said first coil spring.

3,958,512
RAPID TRANSIT SYSTEM

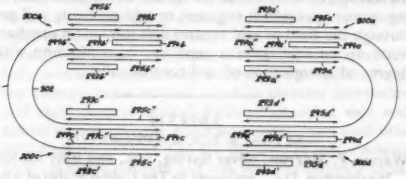
Jerzy G. Stankiewicz, Oberkircherg. 38/1/4, Vienna, Austria (A-1190)

Continuation-in-part of Ser. No. 277,921, Aug. 4, 1972, Pat. No. 3,847,496, which is a continuation-in-part of Ser. No. 207,372, Dec. 13, 1971, abandoned. This application Nov. 5, 1974, Ser. No. 521,099

Claims priority, application Austria, Dec. 11, 1970, 11137/70

Int. Cl.² B61K *1/00*

U.S. Cl. 104—20 **10 Claims**



1. A rapid-transit system comprising:
a plurality of stations each including a loading platform and an unloading platform;
a rail link for said stations including at least one main track passing between said platforms;
a first and a second ancillary track flanking said main track at least in the region of each station;
an express carrier on said main track moving at a substantially constant speed past said stations;
a first shuttle carrier on said first ancillary track for loading said express carrier at a location downstream of the loading platform of a station, said first carrier being accessible from said loading platform and being accelerable from standstill at said loading platform to the speed of said express carrier for pulling alongside same and docking therewith temporarily at said downstream location to facilitate transfer of its load to said express carrier, followed by undocking and deceleration to standstill; and
a second shuttle carrier on said second ancillary track for unloading said express carrier at a location upstream of the unloading platform of a station, said second shuttle carrier being accelerable from standstill to the speed of said express carrier for pulling alongside same and docking therewith temporarily at said upstream location to facilitate transfer from said express carrier of some of the load thereof, followed by undocking and deceleration to standstilll at said unloading platform for discharging the transferred load thereat.

3,958,513
AUTOMATIC FLUID MOTOR RAILWAY CAR RECHARGING

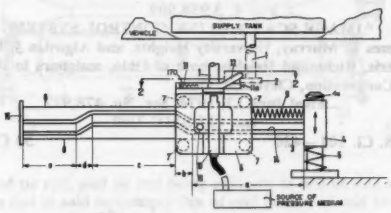
Hans Pollinger; Erich Huber; Pierre Baronnet, all of Munich, and Walter Kugler, Puchheim-Bahnhof, all of Germany, assignors to Knorr-Bremse GmbH, Munich, Germany

Filed Mar. 29, 1974, Ser. No. 456,362

Claims priority, application Germany, Mar. 30, 1973, 2315949

Int. Cl.² B61B *13/12*; **B61C** *7/02, 8/00, 17/06*

U.S. Cl. 104—157 **9 Claims**



1. In a vehicle, particularly a railway vehicle, having pneumatic actuated devices connected to a pneumatic system including a refillable supply tank connected to the pneumatic devices, an apparatus for coupling and uncoupling the vehicle supply tank to a source of pressure medium while the vehicle approaches the source in a direction of travel and comprising a supply funnel connected to the vehicle supply tank, a supply nozzle connected to a source of pressure medium at a station and moveable in said direction of travel, receiver means at said supply nozzle, and contact means on said vehicle engageable with said receiver means as the vehicle enters the station and approaches the source of pressure medium for aligning coaxially said funnel and nozzle during movement of the vehicle and for imparting relative longitudinal movement between said funnel and nozzle after the funnel and nozzle are aligned to couple said funnel and nozzle.

3,958,514
AUTOMATIC HOPPER GATE LOCKING MECHANISM

Roger L. Akester, St. Charles; Richard H. Dugge, St. Louis; Wallace Lee Fossett, Weldon Spring Heights, and Jerry D. Waddell, O'Fallon, all of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

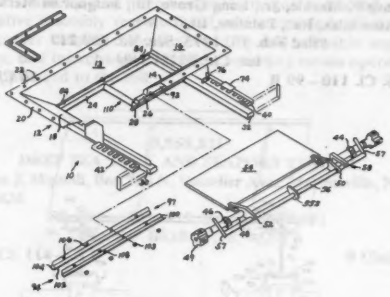
Division of Ser. No. 429,466, Dec. 28, 1973, Pat. No. 3,877,392. This application Aug. 29, 1974, Ser. No. 501,718

Int. Cl.² B61D *7/02, 7/20, 7/22, 7/26*

U.S. Cl. 105—282 A **5 Claims**

1. A gravity outlet comprising:
inclined longitudinal and transverse front and rear downwardly extending pans defining a discharge opening; a gate movable in a longitudinal direction between open and closed positions wherein in closed position said opening is closed by said gate and wherein in open position lading may be discharged through said opening; an elastomeric sealing means engaging said gate in a compression fit when said gate is in closed position; at least one rack affixed to said gate, a pinion shaft journaled in a fixed frame portion of the outlet; at least one pinion affixed to said pinion shaft, said pinion adapted to engage said rack to move said gate between open and closed positions; means for rotating said pinion shaft to move said gate between open and closed positions; a locking shaft mounted for longitudinal movement with said gate; a locking member affixed to said locking shaft to provide

limited free rotation therebetween; means for rotating said locking shaft to move said locking member between a locking position wherein said locking member engages a first locking lug mounted on a fixed portion of said outlet, and an open position; a tripping lug mounted on a fixed portion of said outlet for tripping said locking member from said open position to a tripped position as said gate is moved from closed toward open position; said

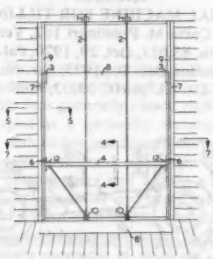


locking member having a locking contour whereby said locking member will automatically assume the locked position engaging said locking lug as said gate moves into the closed position, said locking shaft also having a locking cam mounted thereon whereby said locking shaft may be moved into an overcenter position wherein said locking cam engages said gate in an overcenter position while said locking member remains in said locked position due to said limited free rotation.

3,958,515
GRAIN DOOR

Donald James F. Goudy, Box 2199, Drumheller, Alberta, Canada (T0J-0Y0)

Filed Oct. 30, 1974, Ser. No. 519,205
Claims priority, application Canada, Dec. 19, 1973, 188550
Int. Cl.² A47H *15/00*
U.S. Cl. 105—467 **9 Claims**

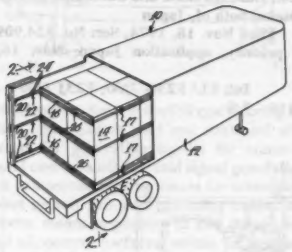


1. A fracturable barrier door for grain cars comprising a grid work removably positioned over the inner face of said door and which includes a horizontal member extending between jambs of the door and at least a pair of vertical cable means secured to and extending between the top and bottom of the door opening and being interconnected with the horizontal member; a disposable diaphram positioned over said grid work on the inside thereof to seal off the interior of the car; and means on the diaphram and on the door jambs for removably securing the diaphram thereto; comprising a vertically extending tubular mount secured to the jamb on each side of the door, an open slot in each mount with said slots facing one another; and a flexible, tubular rope means integral with the terminal side edges of the diaphram whereby the rope means may be guided into the tubular mounts with the diaphram extending outwardly through the slots.

3,958,516
LOAD ANCHOR MEANS

Nelson Cheung, Arlington Heights, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Dec. 20, 1974, Ser. No. 535,036
Int. Cl.² B61D *45/00*
U.S. Cl. 105—478 **15 Claims**

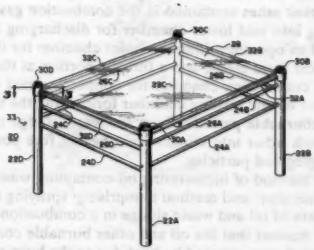


1. A load anchor means for securing a strap to a fixed track having a plurality of openings adapted to receive said load anchor means which comprises a pair of elongated, asymmetric, substantially rigid anchor plates juxtaposed relative to one another, each anchor plate being defined by a pair of transverse edges and a pair of lateral edges, each transverse edge being provided with a notch for engaging said track and both notches together delineating a head portion receivable in said opening and a base portion; the base portion being provided with an aperture for receiving said strap, both of said anchor plates being receivable in said openings in said track and movable relative to one another to position said anchor plates with said apertures in registry with one another, whereby said head portions of both anchor plates engage said track to retain said load anchor means in said track.

3,958,517
TABLE

Walter M. Jay, 16 Tweed Road, Fox Lake, Ill. 60020

Filed May 14, 1975, Ser. No. 577,231
Int. Cl.² A47B *3/06*
U.S. Cl. 108—159 **16 Claims**



1. Apparatus for mounting a table top to the table legs of a table, comprising:

table top retaining means having at least one wall portion for engaging at least one portion of the surfaces of the table top so as to restrain its upward movement;

a decorative top portion integrally formed with said table top retaining means and extending upwardly therefrom; and

friction means for engaging the wall of a table leg substantially across areas extending through a 360 degree angle about the longitudinal axis of the table leg;

said friction means being integrally formed with said table top retaining means and extending downwardly therefrom.

3,958,518

INCINERATOR FOR OIL-CONTAINING WASTE SLUDGE AND METHOD THEREOF

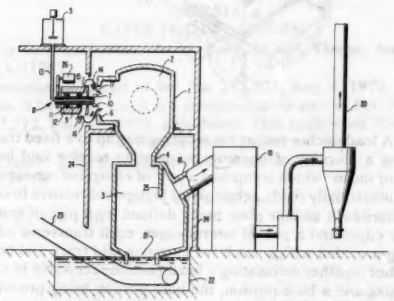
Masaharu Yoshida, Hirakata, Japan, assignor to Sunray Reinetsu Co., Ltd., Hirakata and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan

Filed Nov. 18, 1974, Ser. No. 524,909

Claims priority, application Japan, Nov. 16, 1973, 48-129481

Int. Cl.² F23G 7/00; F23J 1/00

U.S. Cl. 110—7 S 6 Claims



1. In an incinerator for oil-containing waste sludge including a furnace, a tank for mixing and stirring the oil-containing waste sludge and oil such as fuel oil or waste oil, at least one burner connected to said tank and receiving said mixture for spraying and incinerating the mixture in said furnace, a gas duct and a flue, the improvement wherein: said furnace is composed of upper and lower chambers, the upper chamber being a combustion chamber with an opening therein, said burner being mounted within said opening for spraying and burning said mixture within said upper chamber to burn the burnable contents of the waste sludge and to render the unburnable contents of the waste sludge into a semi-molten state, said lower chamber being a settling chamber for settling the clinker ashes contained in the combustion gas, a gas duct opening into said lower chamber for discharging combustion gas and an opening within the lower chamber for the recovery of clinker form ashes, and a throttle portion at the lower end of said combustion chamber for connecting said combustion chamber to said settling chamber for causing the semi-molten fine unburnable particles from the waste sludge to aggregate with each other into clinker form having fine pores between the aggregated particles.

6. A method of incinerating oil-containing waste sludges in an incinerator, said method comprising: spraying and burning a mixture of oil and waste sludge in a combustion chamber in such a manner that the oil and other burnable contents of the waste sludge are burned by heat due to the burning of said oil and other burnable contents, and unburnable fine particles from the waste sludge are incinerated to such an extent that they are rendered into a semi-molten state, causing the semi-molten fine particles to aggregate with each other into clinker form having fine pores between aggregated particles in a throttle portion of said furnace leading to a settling chamber beneath said furnace, causing the clinkers in the throttle portion of said furnace to settle down into the settling chamber, taking out the clinkers from the bottom opening of the settling chamber and discharging waste gas from combustion through a gas duct within said settling chamber.

3,958,519

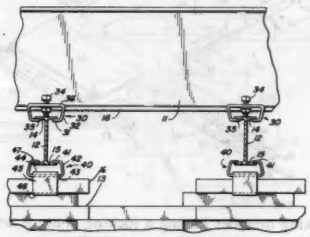
HIGH TEMPERATURE FURNACE CONSTRUCTION AND HANGERS THEREFOR

Frank P. Merkle, Jr., Long Grove, Ill., assignor to Merkle & Associates, Inc., Palatine, Ill.

Filed Feb. 18, 1975, Ser. No. 550,217

Int. Cl.² F22M 5/04

U.S. Cl. 110—99 R 10 Claims



1. High temperature refractory structure having refractory brick lining including a support frame; a plurality of space hanger beams inwardly from said support frame and having opposed flanges; a plurality of spaced structural plate hanger beam clips engaging one of said hanger beam flanges for attachment to said support frame; a plurality of structural plate refractory hangers having two interlocked opposing U-shaped portions, one of the U-shaped portions engaging the other of said hanger beam flanges; and a plurality of refractory brick supported by said refractory hangers; the other of the U-shaped portions of said refractory hangers engaging hanger flanges of refractory bricks thereby supporting said refractory brick lining, said refractory brick hanger flanges being at approximately right angles to said hanger beam flanges.

3,958,520

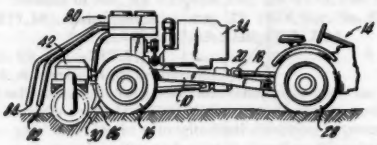
AGRICULTURAL MACHINE FOR TILLING THE SOIL

Natale Cantone, Corso M. Prestinari 162, Vercelli, Italy

Division of Ser. No. 85,021, Oct. 29, 1970, Pat. No. 3,779,320. This application Dec. 20, 1973, Ser. No. 426,607

Int. Cl.² A01C 23/02, 7/08

U.S. Cl. 111—6 4 Claims



1. A machine for treating the soil comprising, in combination, a main frame; wheels supporting said main frame for translational movement over the ground; an operative assembly, including implements rotatable about a horizontal axis perpendicular to the direction of said translational movement, operable to break and work the soil; means pivotally mounting said operative assembly on said main frame for pivoting about a horizontal axis for elevational displacement of said operative assembly relative to said main frame; motor means supported on said main frame and operatively connected to said rotatable implements to rotate the latter in a direction impelling

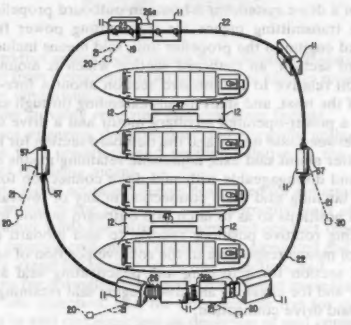
said machine forwardly; a steering assembly; means pivotally connecting said steering assembly to said main frame; said steering assembly including driving wheels, means for steering said driving wheels, and motor means operatively connected to said driving wheels; whereby said steering means is operable to control the direction and speed of the translational movement of said machine; tank means for carrying fertilizer material, supported by said main frame; means operable to diffuse fertilizer material from said tank means onto the ground in front of said rotatable implements for working into the soil thereby; and interchangeable means carried by said operative assembly rearwardly of said rotatable implements for further treating the soil worked by said rotatable implements; said interchangeable means including means operable to supply seed to the soil.

3,958,521

DEEP SEA TANK AND SEAPORT SYSTEM

Steven J. Memoli, Box 720 N. Vosseller Ave., Martinsville, N.J. 08836

Filed May 30, 1975, Ser. No. 582,091
Int. Cl.² B63B *25/08, 35/32*
U.S. Cl. 114—.5 T **9 Claims**



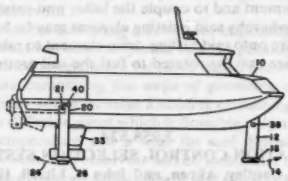
1. Apparatus for containing materials floating on the surface of a body of water, comprising: a plurality of tanks connected by a cable in a generally closed pattern, each of said tanks being shaped as a generally rectangular box-shaped hollow member with its longest dimension being the horizontally disposed length of the tank which extends parallel to the barrier formed by the tanks and having a bottom and top surface connected by an inner and outer vertical surface and a pair of vertical end surfaces, the top surface and outer vertical surface of each tank being connected by an inclined planar surface which slants upwardly at an angle of approximately 45°, a plurality of vertical baffle plates attached within each tank to the bottom and alternately to the inner and outer vertical surfaces of the tank, the width of the baffle plates being about one-half the width of the tank, the height of the baffle plates attached to the inner vertical surface being greater than the height of the plates attached to the outer vertical surface, means for introducing water into said tanks, a port in the top surface of each tank for removal of water therefrom, a skirt member attached to the end surfaces of each of the adjacent tanks and being of sufficient height to prevent said floating materials from passing between the tanks, and means for anchoring alternate tanks to the sea bed underlying said body of water.

3,958,522

AUTOMATIC CONTROL SYSTEM FOR HYDROFOIL CRAFT

Arlyn Orlando Harang, Seattle; John Hunt Scott, Issaquah, and Irving Alfred Hirsch, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 16, 1973, Ser. No. 342,024
Int. Cl.² B63B *1/28*
U.S. Cl. 114—66.5 H **6 Claims**



1. In a control system for a hydrofoil craft having a forward control surface and separate port and starboard aft control surfaces, means for generating signals for controlling the positions of said control surfaces, said signal generating means including first and second sensing means for sensing motion of the craft about its roll axis and providing output signals in response thereto, means responsive to said output signals for actuating said aft control surfaces, means for comparing the output signals of said first and second sensing means, and means responsive to a predetermined difference between said signals for actuating said forward control surface to cause the craft to descend from the foil-borne mode to the hull-borne mode of operation.

3,958,523

SAIL HOISTING, SUPPORTING AND FURLING APPARATUS

Tracy S. Holmes, Santa Monica, and Thomas J. Simms, Jr., Long Beach, both of Calif., assignors to Tracy Holmes Corporation, Santa Monica, Calif.

Filed May 30, 1975, Ser. No. 582,082
Int. Cl.³ B63H *9/04*
U.S. Cl. 114—106 **18 Claims**

11. In a sail hoisting, supporting and furling apparatus mountable on a sailboat between the hull and the mast thereof, and including an elongated wire having upper and lower end and capable of transmitting torsional force from the lower end to the upper end, upper mounting means for supporting the wire for rotation about its longitudinal axis, and

lower mounting means for connecting the lower end rotatably to the hull, the improvement which comprises:

a hoisting element telescoped slidably over said wire with a loose, clearance fit for movement longitudinally along the luff wire, and having means thereon for connection to a sail, said hoisting element having an internal passage of non-circular cross-sectional shape;

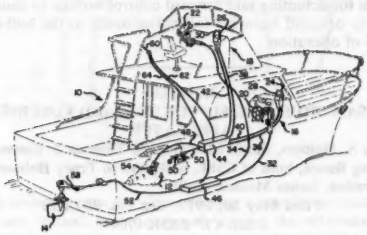
and a furling-drive element affixed to said wire in a preselected position and having a non-circular outside surface sized and shaped to fit slidably and snugly into said hoisting element and to couple the latter non-rotatably to said wire, whereby said hoisting element may be hoisted along the wire onto said furling-drive element to raise a sail, and the wire may be rotated to furl the sail around the wire.

3,958,524

STATION CONTROL SELECTION SYSTEM

George A. Cantley, Akron, and John E. Litzell, Hudson, both of Ohio, assignors to Incom International, Inc., Pittsburgh, Pa.

Division of Ser. No. 515,185, Oct. 16, 1974. This application Aug. 4, 1975, Ser. No. 601,771
Int. Cl.² G05G 5/06
U.S. Cl. 114—146 2 Claims



1. A system for controlling a motor and rudder of a power boat selectively from either of two remote stations, each of which includes means for producing linear input signals for motor shift and throttle control and for steering control comprising:

a steering input selector mechanism capable of transmitting said linear input signal for steering control from one of said stations to said rudder while isolating said linear input signal for said steering control from the other of said stations;

a motor input selector mechanism capable of transmitting said linear input signals for motor shift and throttle control from said one of said stations to said motor while isolating said linear input signals for motor shift and throttle control from said other of said stations;

said steering input selector mechanism and said motor input selector mechanism being capable of actuation to facilitate the selection of said one of said stations whenever corresponding said linear input signals from said two stations are substantially equal; and

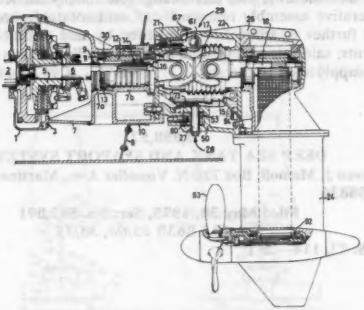
means for initiating said actuation to facilitate said selection of said one of said stations prior to said corresponding said linear input signals from said two stations being substantially equal.

3,958,525

ARRANGEMENT FOR SERVO-CONTROLLED ADJUSTMENT AND TURNING OF AN OUTBOARD DRIVE

Lars Gunnar Valter Luthman, Tullinge, Sweden, assignor to Saab-Scania Aktiebolag, Sodertalje, Sweden

Filed Apr. 17, 1975, Ser. No. 568,839
Claims priority application Sweden, Apr. 22, 1974, 7405397
Int. Cl.² B63H 5/13
U.S. Cl. 115—41 R 7 Claims



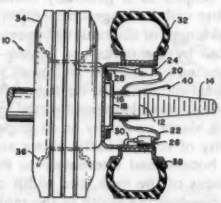
1. In a drive system for a boat: an outboard propeller unit; power transmitting means for transmitting power from an inboard engine to the propeller unit, said means including an inboard section, an outboard section which is mounted for rotation relative to the inboard section about a fore-and-aft axis of the boat, and shaft means extending through said sections; a power-operated auxiliary motor and a drive connection between said motor and the outboard section for rotating the latter about said axis; adjustable retaining means engageable and disengageable with said drive connection for selectively latching said drive connection in any of several preselected positions so as to latch said outboard section in corresponding rotative positions relative to said inboard section; control means responsive to the rotative position of said outboard section for activating and deactivating said auxiliary motor and for engaging and disengaging said retaining means with said drive connection.

3,958,526

SOFT TIRE ALARM

Bernard F. Liquie, 1498 Nancy Wood Drive, Apt. 8, Pontiac, Mich. 48054

Filed Aug. 26, 1974, Ser. No. 500,379
Int. Cl.² B60C 23/04
U.S. Cl. 116—34 R 1 Claim



1. Tire pressure indicating apparatus comprising a warning bladder, means for securing the warning bladder to the wheel of a vehicle for extension transversely of the vehicle on inflation of the bladder, means for connecting the bladder to at least one vehicle tire including pressure sensitive valve means for inflating the bladder from the tire in response to predetermined tire pressure wherein the means for connecting the bladder to the tire includes a pressure conduit between the bladder and valve means, a check valve operably associated

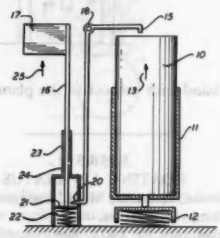
with the pressure conduit operable under pressure to permit air under pressure to flow into the bladder and to prevent return air flow from the bladder into the tire, and wherein the valve means includes a valve operable to open a passage between the tire and bladder, a spring biasing the valve toward an open position in opposition to tire pressure and a screw for adjusting the spring bias on the valve.

3,958,527

AUTOMATIC PRODUCT DEPLETION INDICATOR

Anthony Iannacone, 60 Watchung, Hawthorne, N.J. 07506

Filed Jan. 17, 1975, Ser. No. 541,880
Int. Cl.² G01F *23/20*
U.S. Cl. 116—114 R **6 Claims**



1. A product empty signal means for indicating depletion of a product from a container reservoir and the need to replenish the same, comprisng:

a. means movably receiving said container therein,

b. means engaging the container and normally urging the same to a predetermined position relative to the container receiving means,

c. empty signal actuating means positioned for actuation on movement of the container while normally clear of the container while the latter contains said product therein,

d. said empty signal means including an elongated rod normally urged for movement in one direction, and

e. means for normally holding the rod against movement in said one direction, and for releasing the rod for movement in said one direction on depletion of said container contents.

3,958,528

PRODUCT THAW INDICATOR

Robert Hill, 150 Robin Way, Los Gatos, Calif. 95030

Continuation of Ser. No. 408,555, Oct. 23, 1973. This application June 23, 1975, Ser. No. 589,362
Int. Cl.² G01K *11/06*
U.S. Cl. 116—114.5 **14 Claims**

1. A device for indicating whether or not a product has been subjected to a temperature greater than a prescribed temperature for more than a predetermined period of time comprising: a housing having an indication area at a first location therein; a diffusion agent; a reservoir for said diffusion agent within said housing at a second location spaced from said first location; a wick for said diffusion agent extending between said first and second locations within said housing, said diffusion agent being capable of diffusion through said wick only when the temperature of said agent is above said prescribed temperature; said housing including a thermal conducting wall portion providing thermal communication between said product and the interior of said housing, and a thermal insulating wall portion substantially isolating the interior of said housing from the ambient temperature around said product, said thermal insulating wall portion including both a heat reflective surface and a material of lower heat conductivity than said reflective surface and said thermal conducting wall portion; and an adhesive covering substantially the full external surface area of said thermal conducting wall portion for adhering substantially said full surface area to said product in good heat transfer contact therewith.

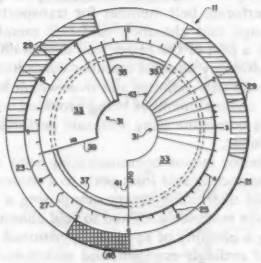
13. A process for activating a device for indicating whether or not a product has been subjected to a temperature greater than a prescribed temperature for more than a predetermined period of time comprising the steps of providing a thermal indicating device which includes a housing containing a closed reservoir of a diffusion agent which is flowable only above said prescribed temperature and a wick for said diffusion agent extending between said reservoir and an indication area, rupturing said reservoir from externally of said housing to release said diffusion agent prior to preventing flow thereof by lowering the temperature thereof below said prescribed temperature, and applying said device to said product.

3,958,529

WORK-TIME INDICATOR

Ralph E. Morris, 7507 Parkwood Court Apt. 204, Falls Church, Va. 22042

Filed July 29, 1975, Ser. No. 599,970
Int. Cl.² G09F *9/00*
U.S. Cl. 116—133 **10 Claims**



1. A work-time indicating device permitting an employee to quickly determine his day's working time in relation to preset mandatory work hours in which he must work, comprising:

face means;

indicia means systematically positioned on said face means corresponding to particular times of day with spacing between said indicia means corresponding to time between said particular times;

first indicator means supported on said face means for visually indicating at least two first time quantities corresponding to mandatory work hours during specific times of day by visually cooperating with said indicia means; and

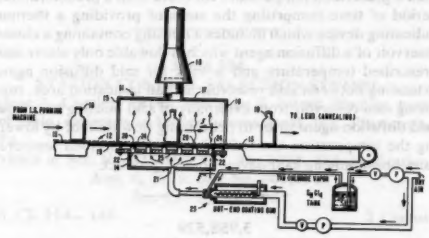
second indicator means slidably supported on said face means and manually positionable in cooperation with said indicia means for visually indicating second time quantities corresponding to day's working time, said second indicator means visually cooperating with said first indicator means for indicating correlation of said first time quantities with said second time quantities.

3,958,530

APPARATUS FOR COATING AN ARTICLE

Michael A. Novice, Elmira, N.Y., assignor to Dart Industries Inc., Los Angeles, Calif.

Division of Ser. No. 280,376, Aug. 14, 1972, abandoned. This application Oct. 17, 1974, Ser. No. 515,743
Int. Cl.² C23C 13/12
U.S. Cl. 118—48 4 Claims



1. An apparatus for coating an object comprising:
A. a coating chamber which is at least partially enclosed,
B. conveyor means for transporting said object through said chamber, said conveyor means comprising:
1. a perforate belt member for transporting said object through said chamber, said belt member forming at least a part of the lower wall of said chamber,
2. a stationary channel member contacting and supporting said belt member and over which said belt moves, said channel member being provided with spaced inlet ports communicating with said perforate belt and said chamber,
C. distributor means communicating with said inlet ports and connecting said inlet ports to a source coating material said distributor means comprising a closed boxlike structure removably affixed to said channel member and having a plurality of apertures positioned in the top wall thereof sealingly engaged, and means sealingly engaging and communicating each aperture with a separate one of said inlet ports.

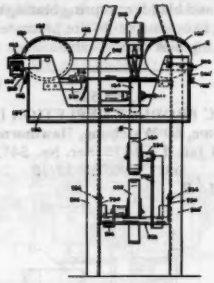
3,958,531

ADJUSTABLE ENDLESS BAND DOCTOR

Carter J. Warne, Wichita Falls, Tex., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 243,991, April 14, 1972, which is a division of Ser. No. 824,153, May 13, 1969, Pat. No. 3,700,519, which is a continuation-in-part of Ser. No. 577,035, Sept. 2, 1966, Pat. No. 3,507,412, which is a continuation-in-part of Ser. No. 387,372, Aug. 4, 1964, abandoned. This application Apr. 1, 1974, Ser. No. 457,011
Int. Cl.² B05C 11/02
U.S. Cl. 118—101 3 Claims

1. Apparatus for coating a strip or the like comprising a frame, a pair of aligned, spaced wheels rotatably mounted on the frame, a flat endless doctor blade band extending around the wheels, means for maintaining the doctor blade band under tension upon the wheels, means for guiding a strip for passage beneath the path of movement of the doctor blade band, means for applying a coating composition on the strip forward of the strip's passage beneath the doctor blade band, and pivot means for the frame for adjusting the angle of the



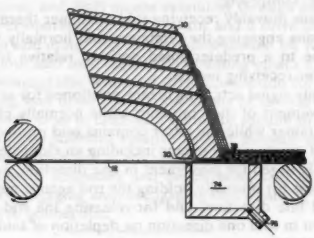
doctor blade band with respect to the plane of movement of the strip.

3,958,532

COATING APPARATUS

William J. Timson, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed July 22, 1974, Ser. No. 490,253
Int. Cl.² B05C 5/02
U.S. Cl. 118—325 4 Claims



1. Web coating apparatus comprising, in combination:
coating composition applicator means including a coating composition deposition portion adapted to deposit at least two discrete continuous layers of coating composition onto a web;
means associated with said applicator means for moving said web past said coating composition deposition portion of said coating apparatus while maintaining said web in a substantially flat, free-floating condition; and
means associated with said applicator means for applying a continuous force to said web to urge it toward said coating composition deposition portion of said applicator thereby minimizing the gap between said web and the coating composition deposition portion of said applicator.

3,958,533

PINSTRIPE APPLICATION SYSTEMS

Richard K. Smejda, 192 Edmund Ave., Paterson, N.J. 07502

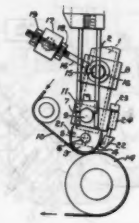
Filed Aug. 27, 1974, Ser. No. 501,076
Int. Cl.² B05C 5/02
U.S. Cl. 118—411 9 Claims

1. A system for striping materials comprising
a plurality of adjacent liquid feeding chambers disposed laterally across a predetermined longitudinal path, said chambers including a plurality of vertical partitions divid-

ing said chambers into like sized independent liquid feeding units,

means feeding a sheet of material along said path,

a plurality of intermediate angled channels directing liquid from said feeding chambers to said sheet, said channels including a plurality of angled partitions separating said channels and crossing said chambers at an angle with respect to said chamber partitions,



means for passing liquid from each liquid feeding chamber to a respective angled channel, and an apertured patterning strip positioned against said angled partitions between said channels and said sheet material and applying liquid from said channels to said sheet, said strip having groups of apertures aligned with respective angled channels to combine liquids along said sheet passing across different channels.

3,958,534

ANIMAL CAGE

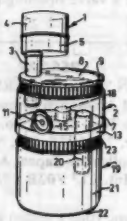
Roy Frederick Perkins, Reigate, and John Richard Calvert, Epping, both of England, assignors to Genyk Products Limited, Mitcham, England

Filed Jan. 10, 1975, Ser. No. 540,295

Claims priority, application United Kingdom, Jan. 14, 1974, 1719/74

Int. Cl.² A01K *1/00*

U.S. Cl. 119—15 **2 Claims**



1. An enclosure for small domestic pet animals comprising a first compartment having a floor, walls and a roof, and an aperture through said floor, a second compartment having a circular floor, a roof having an aperture therethrough and a continuous circular wall having a lower edge cooperating with said circular floor to permit relative rotation between said continuous circular wall and said circular floor to thereby provide means for adjusting said roof with respect to said circular floor, and a hollow passageway member joining said first and second compartments through said apertures.

3,958,535

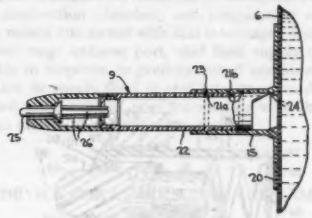
UNIVERSAL ANIMAL FEED BAG

Matthew Salvia, Coldspring Road, Stanfordville, N.Y. 12581

Filed Oct. 24, 1974, Ser. No. 517,509

Int. Cl.² A01K *7/00*

U.S. Cl. 119—72.5 **1 Claim**



1. A universal disposable water bag for feeding laboratory animals comprising a generally rectangular, flat bag of plastic sheeting adapted to be heat sealed and enclose a quantity of sterile water, having a demand feeding valve made of hard moldable plastic, heat sealed to a flat face of said bag, said valve comprising a fitment with two longitudinally spaced detents and a flange portion that is heat sealed to the bag, a valve body having a boss normally engaging the detent farthest from the flange, a piercing means at the end within said fitment and a demand feeding valve with a spring reed control means at the other end whereby pushing the valve body towards the flange to engage the other detent will pierce the bag and release the sterile water for feeding the animals.

3,958,536

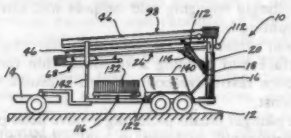
POULTRY CONVEYOR MEANS

Delphin F. Crowder, Rte. 7, Harrison, Ark. 72601

Filed Apr. 22, 1975, Ser. No. 570,485

Int. Cl.³ A01K *29/00*

U.S. Cl. 119—82 **16 Claims**



1. A poultry conveyor means comprising,

a portable frame means,

a first support means mounted on said frame means and extending upwardly therefrom,

a first poultry conveyor means rotatable and pivotally mounted at one end thereof to said first support means and normally extending downwardly therefrom,

a second poultry conveyor means rotatably and pivotally mounted at one end thereof to said first support means and normally extending upwardly therefrom,

means for transferring the poultry from said one end of said first poultry conveyor means to said one end of said second poultry conveyor means,

first means at the other end of said first poultry conveyor means for moving the poultry onto said first poultry conveyor means,

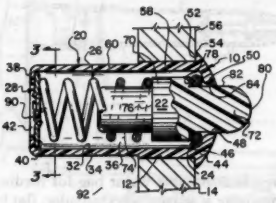
second means at the other end of said second poultry conveyor means for discharging the poultry into coops,

and means for maintaining said poultry on said first and second poultry conveyor means.

3,958,537
OIL AND INSECTICIDE DISPENSING APPARATUS FOR LIVESTOCK

Edward Sittner, Torrington, Wyo., assignor to Sittner Manufacturing Co., Inc., Sheridan, Wyo.

Filed June 6, 1973, Ser. No. 367,435
Int. Cl.² A01K 29/00
U.S. Cl. 119—157 4 Claims



2. Apparatus for dispensing fluid such as oil and insecticide or the like to livestock rubbing thereagainst comprising:

support means defining a fluid storage chamber including a support wall,

a mounting bore extending through said wall,

valve housing means of one piece plastic material fixedly mounted in said mounting bore,

an elongated chamber defined by said valve housing means and having an inlet opening at one end in fluid communication with said fluid storage chamber and an outlet opening at the opposite end in fluid communication with the atmosphere,

an end wall on said housing means located outwardly beyond said support wall,

a radially extending portion of said end wall extending radially outwardly beyond said mounting bore,

an abutment surface on said radially extending portion abuttingly engaging said support wall circumjacent said mounting bore,

an outer surface on said end wall intersecting said abutment surface and defining a relatively thin terminal edge to reduce restrictive contact with livestock rubbing thereagainst,

valve plunger means including a valve head portion slidably reciprocably mounted in said elongated chamber for movement between a closed position relative to said outlet opening and variable axially inwardly located open positions relative thereto,

spring means mounted in said elongated chamber and resiliently biasing said valve plunger means to the closed position,

a valve actuating portion of said valve plunger means extending outwardly from said elongated chamber through said outlet opening and terminating in a nose portion located outwardly of said support means and said valve housing means a distance sufficient to enable operative engagement with livestock rubbing thereagainst, and

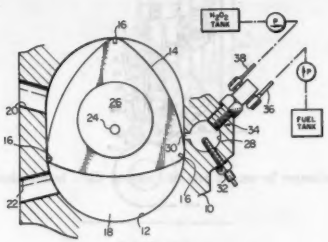
an O-ring type sealing member mounted on said valve actuating portion in sealing engagement therewith and with said valve head portion and being sealingly engageable with said valve housing means in a closed position relative to said outlet opening,

said sealing member being movable with said valve plunger means to variably axially inwardly displaced open positions relative to said outlet opening and being made of a material which is relatively inert and impermeable to the fluid being dispensed.

3,958,538
GASEOUS IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Yasunari Hoshino, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Division of Ser. No. 359,917, May 14, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,551
Claims priority, application Japan, May 15, 1972, 47-47167
Int. Cl.² F02B 53/12
U.S. Cl. 123—8.09 4 Claims



1. In combination with a trochoidal type rotary piston internal combustion engine in which a multi-lobed rotor is mounted for rotational movement within a housing having a basically epitrochoidal profile to form a main combustion chamber and which is operated on a combustible charge supplied to the combustion chamber,

a gaseous ignition system comprising:

an auxiliary chamber communicating with the main combustion chamber through an ignition aperture; and

an injector nozzle having an injector body including a valve chamber communicating with a fuel source under pressure in timed relation with engine revolution of the engine and a valve seat connecting the valve chamber, through a discharge channel, with the auxiliary chamber, the valve seat being formed with a port therein which communicates with a hydrogen peroxide source under pressure, and having an injection control valve means yieldably biasing said injection control valve in one direction toward a valve closing position to engage the valve seat to close the port and to block communication between the valve chamber and the auxiliary chamber, the injection control valve having an area exposed to fluid pressure in said valve chamber to be urged in the opposite direction toward a valve opening position against yieldably biasing force.

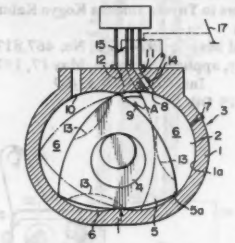
3,958,539
FUEL INJECTION TYPE ROTARY PISTON ENGINE

Haruhiko Satow, and Masaharu Shimoji, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Japan

Filed Apr. 22, 1975, Ser. No. 570,997
Claims priority, application Japan, Apr. 29, 1974, 49-48570
Int. Cl.² F02B 53/10
U.S. Cl. 123—8.09 5 Claims

1. Fuel injection type rotary piston engine including a rotor casing which comprises a rotor housing having a trochoidal inner wall and a pair of side housings secured to the opposite sides of the rotor housing to define a rotor chamber therein, a substantially polygonal rotor disposed in said rotor chamber for revolution and rotation therein with apices thereof in sliding contact with said trochoidal inner wall of the rotor housing so as to define working chambers of variable volume between the casing and the rotor, first air intake port means formed in at least one of said side housings so as to open into the rotor chamber so that it cyclically communicates with one of the working chambers which is in intake stroke, first intake passage means communicating with said first air intake port means and having first throttle valve means disposed therein,

second intake port means formed in said rotor housing so as to open into the rotor chamber so that it cyclically communicates with the working chamber in intake stroke, second air intake passage means communicating with said second air intake port means and having second throttle valve means disposed therein, means for closing said first throttle valve means in said first air intake passage means during light load operation of the engine while the second throttle valve of said second air intake passage means is still open, means for closing said second throttle valve means during heavy load operation of the engine while the first throttle valve is opened, said second air intake port means having effective area smaller than that of the first intake port means, said second intake port means being located in such a position that it is closed after the rotor has passed through a position in which the related working chamber has the maximum volume and also after the first intake port means has been closed, and fuel injection means for injecting fuel into the working chamber in intake stroke.



3,958,540

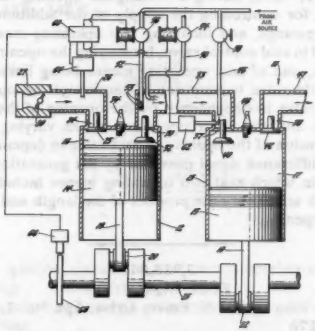
STAGED INTERNAL COMBUSTION ENGINE WITH INTERSTAGE TEMPERATURE CONTROL

Robert M. Siewert, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 5, 1974, Ser. No. 485,941

Int. Cl.² F02B 75/20

U.S. Cl. 123—59 EC **7 Claims**



1. In combination with a staged internal combustion engine of the type having housing means defining first and second stage expansible combustion chambers each including inlet and exhaust ports and means connected with an output shaft to cyclically expand the contract said chambers and control said ports to consecutively cause admission and combustion of combustible mixtures in said chambers and exhaust of burned mixtures from said chambers with a resultant delivery of power to said output shaft, said engine including means for delivering a rich combustible mixture to said first stage chamber for combustion therein, means communicating the exhaust port of said first stage chamber with the intake port of said second stage chamber for transferring partially burned fuel charges from the first stage to the second stage combustion chamber, said communicating means including an interstage conduit, secondary air supply means connecting with said interstage conduit to supply supplementary air for mixture with said partially burned fuel charges in said conduit to form dilute combustible mixtures for admission to said second stage combustion chamber, and temperature control fluid supply means connected with said interstage conduit adjacent said first stage exhaust port, said fluid supply means being operable in response to predetermined conditions of engine operation to supply fluid to said interstage conduit adjacent said first stage exhaust port for mixture with the interstage gases to control the temperature thereof.

3,958,541

DEVICE FOR LUBRICATING THE CAMS OF CAMSHAFTS

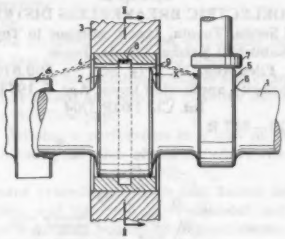
Detlev Lachnit, Opladen, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg AG, Nurnberg, Germany

Filed Oct. 29, 1974, Ser. No. 518,758

Claims priority, application Germany, Oct. 26, 1973, 2353736

Int. Cl.² F01M 1/06

U.S. Cl. 123—90.34 **8 Claims**



1. In combination with a camshaft of a reciprocable piston engine, which camshaft is provided with cam means and which engine has an oil pump associated therewith; a device for lubricating the cam means of said camshaft, which includes bearing means, a camshaft rotatably journalled in said bearing means, each said bearing means being provided with at least one axial groove and at least one circumferential groove therein communicating with said axial groove, and an oil supply conduit communicating with said oil pump, and with said circumferential groove for supplying oil under pressure from the engine oil pump to said circumferential and axial grooves, said axial groove being so arranged relative to the cam surface to be lubricated that at selected times pressurized oil supplied to said axial groove is sprayed continuously from said axial groove to a particular selected portion of said cam means.

3,958,542

THROTTLE CONTROL APPARATUS USING PEDAL RESISTANCE

James L. Tanner, Reseda, Calif., assignor to Tanner Electronics Systems Technology, Northridge, Calif.

Filed Mar. 18, 1974, Ser. No. 452,235

Int. Cl.² F02D 11/08

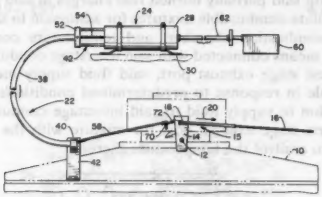
U.S. Cl. 123—103 E **10 Claims**

1. Apparatus for affecting control of the throttle actuating mechanism of an internal combustion engine having a throttle actuating linkage steadily movable from a throttle closed position to a throttle open position, and comprising:

resistance means for applying to the linkage, at a predetermined point in its excursion from closed to open position,

a resistive force which resists further movement toward open position;

vacuum means responsive to increase in engine vacuum for moving said point so that said point is encountered closer to the throttle open position of the linkage, and responsive to decrease in engine vacuum for moving said point



so that said point is encountered closer to the throttle closed position of the linkage;

said resistance means including a flexible line having one end connected to said linkage; and

said vacuum means adapted to move said point by varying the slack in said flexible line.

3,958,543

PHOTOELECTRIC BREAKERLESS DISTRIBUTOR

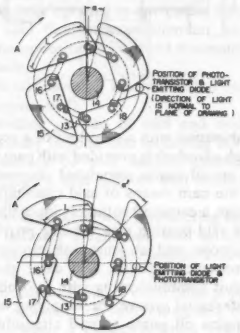
Katsuyuki Senda, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Aug. 27, 1974, Ser. No. 500,876

Claims priority, application Japan, Apr. 5, 1974, 49-38660

Int. Cl.² F02P *5/04*

U.S. Cl. 123—117 R **7 Claims**


POSITION OF PHOTO-TRANSISTOR & LIGHT EMITTING DIODE
(DIRECTION OF LIGHT IS NORMAL TO PLANE OF DRAWING)
POSITION OF LIGHT EMITTING DIODE & PHOTOTRANSISTOR

1. An ignition system for an internal combustion engine of the type in which at the instant when a light path provided by a light emitting element and a photoelectric element is blocked the flow of primary current to an ignition coil is cut off to generate a secondary voltage, said ignition system comprising:

a rotary disk fixedly mounted on the rotating shaft of a distributor and rotatable along with said distributor shaft;

a light emitting element and a photoelectric element mounted on said distributor for providing a light path outside the periphery of said rotary disk;

a plurality of weights pivotally mounted on said rotary disk to intermittently block said light path in accordance with the rotation of said rotary disk; and

spring means for limiting the pivotal movement of said weights, wherein each of said plurality of weights is constructed in such a manner that said weight is thrown outward against the force of said spring means in accordance with an increase in the rotational speed of said distributor shaft, and the circumferential length of the portion of said weight that blocks said light path gradually varies in accordance with the outward movement of said weight.

3,958,544

AIR-FUEL RATIO CONTROL DEVICE IN AN INTERNAL COMBUSTION ENGINE

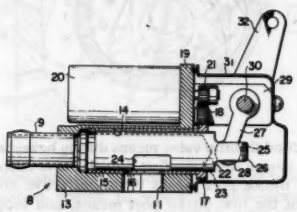
Kazuo Shinoda, Toyota, and Hiroshi Koide, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyoto, Japan

Filed May 7, 1974, Ser. No. 467,817

Claims priority, application Japan, May 17, 1973, 48-54128

Int. Cl.² F02B *33/00*

U.S. Cl. 123—119 DB **3 Claims**



1. An air fuel ratio control device in an internal combustion engine including an intake manifold, an exhaust manifold, a carburetor having a throttle valve and providing a fuel-air mixture, an oxygen sensor provided in the exhaust manifold and producing a first output signal corresponding to the concentration of oxygen in the exhaust manifold, a signal source for producing a second output signal representative of a desired air-fuel ratio, and means, responsive to the first output signal and second output signal, for generating a signal corresponding to the difference between the first output signal and second output signal, comprising:

a passage for supplying additional air into the intake manifold for diluting the fuel-air mixture provided by the carburetor; and

a control valve, having a rectangular opening variable in area, for controlling the supply of the additional air in said passage, and including two operating means, provided in said control valve, for varying the opening of said valve, one of said operating means being linked to the throttle valve to vary one dimension of the opening of said valve in dependence on the opening of the throttle valve and the other operating means varying another dimension of the opening of said valve in dependence on the difference signal provided by the generating means, and in which said two operating means include means which act to vary the product of the length and width of the opening.

3,958,545

FUEL INJECTORS

James E. Teague, 221 N. Emery Drive, Apt. No. 7, Sterling, Va. 22170

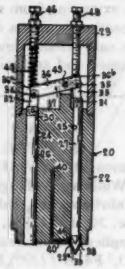
Filed June 30, 1975, Ser. No. 591,394

Int. Cl.² F02M *49/02*

U.S. Cl. 123—139 AJ **10 Claims**

1. In an internal combustion engine (10), a block (11, 12) having at least one combustion chamber (16), said block having an opening (21) therein communicating with said chamber, a body member (22) mounted in said opening, said member (22) having a pair of axially unalined bores (24, 25) extending outwardly from said chamber, a pair of plungers (26, 27) reciprocably mounted in said bores respectively, a fixed-length driving connection (37) for instantaneously

transmitting the reciprocable movements of the plungers (26, 27) one to another, an atomizing nozzle (38) restricting the communication between the inner end of one of said bores (25) and said chamber (16), the inner end of the other of said bores (24) having relatively unrestricted communication with



said chamber, and means (40) for supplying a charge of fuel into said restricted bore (25) at an inlet (41) located upstream from said nozzle (38), the plunger (27) in said restricted bore (25) being movable downstream toward said nozzle to close said inlet (41) and to expel said fuel charge in the order named.

3,958,546

IGNITION CIRCUIT FOR THE INTERNAL COMBUSTION ENGINE AND PREMATURE IGNITION PREVENTION METHOD IN THE IGNITION DEVICE

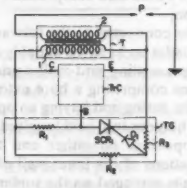
Yoshinori Ohki, Tokyo, and Yoshio Kato, Ichikawa, both of Japan, assignors to Iida Denki Kogyo K.K., Tokyo, Japan

Filed Dec. 27, 1973, Ser. No. 428,833

Claims priority, application Japan, Dec. 30, 1972, 47-627; Jan. 17, 1973, 48-7513; May 2, 1973, 48-50080; May 17, 1973, 48-58297; May 26, 1973, 48-61707; Nov. 29, 1973, 48-134520; Nov. 29, 1973, 48-134521; Nov. 29, 1973, 48-137901; Nov. 29, 1973, 48-137902; Nov. 29, 1973, 48-137903

Int. Cl.² F02P *1/00, 5/04*

U.S. Cl. 123—148 E **5 Claims**



1. An ignition circuit for an internal combustion engine comprising:

a. a transformer having a primary winding and a secondary winding;

b. an electronic switching circuit, including a gate terminal, connected across said primary winding; and

c. a trigger circuit connected across said primary winding for controlling the conductivity of said electrical switching circuit to thereby periodically induce a short-circuit current in said secondary winding, said trigger circuit including a first silicon controlled rectifier connected in series with a first bias resistor across said primary winding, said gate terminal being connected at a point between said first bias resistor and said silicon controlled rectifier.

3,958,547

SPRING-LOADED FUEL STORING DEVICE

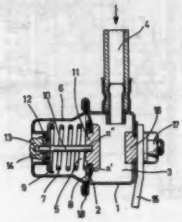
Oyuki Ogawa, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 20, 1973, Ser. No. 417,486

Claims priority, application Japan, Nov. 27, 1972, 47-137001[U]

Int. Cl.² F02B *77/00*

U.S. Cl. 123—198 D **3 Claims**



1. In combination with a fuel system of an internal combustion engine, a spring-loaded device for use in the fuel system to maintain pressure therein and ensure warm starting of the engine, comprising,

a. a housing,

b. a flexible membrane mounted within said housing and defining two chambers with said housing,

c. fuel supply means extending to one of said chambers, said fuel supply means and said one chamber defining a portion of a fuel flow path

d. means defining a perforation in a wall of the housing communicating the other of said chambers with the atmosphere,

e. rod means extending through said means defining the perforation and into said other chamber and having a terminus connected to said flexible membrane,

f. spring means,

g. means mounting said spring means in said other chamber between the perforation and the diaphragm, and

h. said rod means further including means at a distal end portion thereof operative with said spring means to close the perforation and thereby prevent the fuel from diverting from its defined fuel flow path and flowing to the atmosphere from said other chamber upon inadvertent fracture of said flexible membrane.

3,958,548

ENGINE WITH DIFFERENTIAL PRESSURE RESPONSIVE PROTECTIVE DEVICE

Ludvik F. Koci, La Grange Park, and John H. Cryder, Plainfield, both of Ill., assignors to General Motors Corporation, Detroit, Mich.

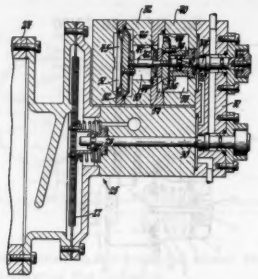
Filed Dec. 23, 1974, Ser. No. 535,412

Int. Cl.² F01P *5/14*

U.S. Cl. 123—198 D **2 Claims**

1. An internal combustion engine having a closed pressurizable liquid cooling system, an engine driven pump having an inlet and an outlet and connected in said cooling system to circulate liquid coolant therethrough by increasing the pressure in said pump outlet relative to that in said pump inlet, the pressure differential between said outlet and inlet normally varying as a function of engine speed, and engine protective means comprising engine shutdown means actuatable to modify normal operation of said engine, differential pressure means operable by said differential pressure between said pump outlet and inlet to oppose actuation of said shutdown means with a force proportional to said differential pressure, and variable biasing means effective to oppose the force of said differential pressure means with a force varying generally

as a function of engine speed and of magnitude less than the force of said differential pressure means when the pump inlet and outlet pressure differential remains above a normal value in relation to engine speed but greater than the force of said



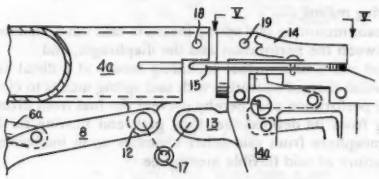
differential pressure means when said differential pressure falls below a predetermined normal value in relation to engine speed, thereby offsetting the force of said differential pressure means and allowing actuation of said shutdown means by said biasing means.

3,958,549

AIR RIFLE HAVING A DETACHABLE REAR BODY

Lennart J. I. Johansson; Bjorn W. Lindqvist, both of Eskilstuna, and Eric V. Wallberg, Vallingby, all of Sweden, assignors to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Apr. 30, 1974, Ser. No. 465,685
Claims priority, application Sweden, May 4, 1973, 7306501
Int. Cl.² F41B *11/00*; F41F *1/04*
U.S. Cl. 124—67 **6 Claims**



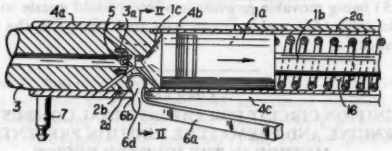
1. An air rifle comprising:
a. an open-ended longitudinally-extending tubular casing supporting a barrel having a bore providing a projectile seat;
b. a compression cylinder slidably mounted in said casing and having an open rear end;
c. a cap member having a channel aligned with said projectile seat closing the forward end of said compression cylinder and forming a seal about said projectile seat when the rifle is in shooting position;
d. a piston having a piston head reciprocably mounted within said compression cylinder defining a compression chamber for directing a blast of compressed gas to project a projectile from said projectile seat;
e. a compression spring housed in said compression cylinder for actuating said piston;
f. a rear body detachably connected to the open rear end of said tubular casing forming a closure therefor and supporting releasable retention means for said compression spring;
g. a trigger mechanism provided with a trigger guard for actuating said retention means;
h. a lever mechanism pivotally connected between said rear body and said cap member effective to move said compression cylinder to the rear and with it said piston to its cocked position and return said compression cylinder to its forward shooting position; and
i. said lever mechanism comprising a tension lever fulcrumed at one end to a tubular shaft interconnecting a pair of brackets extending from said casing and from said rear body, respectively, and a draw bar pivotally connected between said tension lever at a location spaced from said fulcrumed end and said cap member.

3,958,550

AIR RIFLE

Lennart J. I. Johansson; Bjorn W. Lindqvist, both of Eskilstuna, and Eric V. Wallberg, Vallingby, all of Sweden, assignors to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Apr. 30, 1974, Ser. No. 465,686
Claims priority, application Sweden, May 4, 1973, 7306301
Int. Cl.² F41B *11/00*; F41F *1/04*
U.S. Cl. 124—67 **7 Claims**

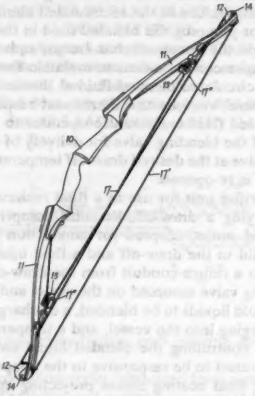


1. A rifle comprising:
a. a tubular casing having a longitudinal slot in its bottom;
b. a barrel supported by said casing and having a bore providing a projectile seat;
c. a compression cylinder slidably mounted within said casing;
d. piston means movable in said casing;
e. spring means within said compression cylinder for actuating the piston;
f. sealing means connected to the forward end of said compression cylinder so as to be slidably mounted therewith and forming a sealing end wall against the barrel, said sealing means comprising a bore extending transverse to the axis of the casing and having an opening facing downwardly which opens into said longitudinal slot and having additional openings on either end thereof which face opposing sections of the inner wall of said casing;
g. tension means arranged on the underside of the rifle for compressing the spring means and including a tension lever pivotally mounted at the rear of said casing; a tension draw bar, one end of which projects into the casing through said longitudinal slot and the other end of which is pivotally connected to said tension lever; said tension draw bar having a forward head portion pivotally mounted in said bore to permit said tension draw bar to be pivoted relative to the axis of the bore; and
h. plug means removably mounted in said bore, said plug means being a separate element from said sealing means and abutting against said forward head portion on each side thereof, said plug means further being shaped and disposed to bear against the casing and against said head portion to hold said head portion in place in said bore by plugging said bore up on either side of said head portion and to act as a bearing surface against said casing for said cylinder.

3,958,551
COMPOUND BOW

Frank W. Ketchum, Jacksonville, Tex., assignor to AMF Incorporated, White Plains, N.Y.

Filed Feb. 26, 1975, Ser. No. 553,140
Int. Cl.² F41B 5/00
U.S. Cl. 124—24 R **3 Claims**



1. In a compound bow having a central handle, a pair of resilient limbs, a bow string spanning the ends of said limbs, and a mechanical advantage device at the ends of said limbs for said string to increase the energy input into said bow and then reduce the force required to hold said string at full draw, the improvement of each of said devices comprising a rotatable wheel assembly having two side by side wheels of unequal diameter which are adapted to turn in unison about a common axis, each of said wheels having a circumferential groove formed therein, the opposite ends of the central stretch of said string being disposed in one of said grooves, the end stretches of said string being disposed in the other of said grooves, and means for adjusting the draw length of said bow independent of the same energy input to said bow, said means comprising replacement means to change just the size of the grooves for the central stretch of said string.

3,958,552
TEMPERATURE CONTROLLED OVEN

Joseph A. Lawler, Flossmoor, Ill., assignor to Blue M Electric Company, Blue Island, Ill.

Continuation-in-part of Ser. No. 223,505, Feb. 4, 1972, Pat. No. 3,807,383. This application Apr. 24, 1974, Ser. No. 463,574
The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.
Int. Cl.² F24C 15/32
U.S. Cl. 126—247 **6 Claims**

1. A temperature-controlled oven comprising, in combination:

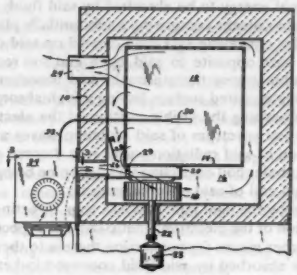
a. an outer thermal-insulation leakage-sealed housing,

b. an inner chamber within the housing adapted to receive bodies to be maintained at constant temperature and having air-inlet and air-outlet portions,

c. air-recirculation means within the housing adjacent to the inner chamber including a constant-speed air-blower and air-duct means guiding outlet air from the chamber back to the inlet portion,

d. a heat energy source in addition to the air-blower disposed exterior of the chamber and within the air-recirculation means for changing the thermal content of the air in the recirculation means at a fixed rate,

e. an air inlet vent and an air outlet vent through the housing in regions of differing internal air pressure, the housing being sealed against leakage, said vents continuously blending air from exterior of the housing into the recirculated air, said exterior air being at a temperature different than the inner chamber, and

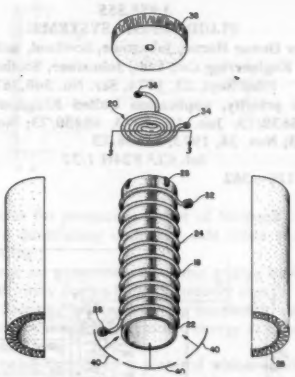


f. means on at least one of said vents responsive to the chamber temperature to vary the rate of blending of exterior air.

3,958,553
SOLAR ENERGY TRAP

Lott W. Brantley, Jr., Union Grove, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 29, 1974, Ser. No. 518,544
Int. Cl.² F24J 3/02
U.S. Cl. 126—270 **4 Claims**



1. A solar energy trap for trapping and absorbing electromagnetic radiation waves emitted from the sun and for converting the radiation waves into thermal energy for heating a fluid comprising:

a. a source of fluid;

b. an elongated tubular light pipe having opened ends and positioned so as to receive said radiation waves through one end thereof;

c. a highly reflective surface coating provided on the interior surface of said light pipe, said surface coating having a low absorption factor for the visible portion of the electromagnetic radiation spectrum and having a high absorption factor for the infrared portion of the electromagnetic radiation spectrum for reflecting said visible

portion and for absorbing infrared radiation generated within said energy trap for conversion into thermal energy by said light pipe;

d. a tubular coil having a plurality of spaced turns encircling said light pipe, for conveying said fluid in a heat exchanging relationship with said light pipe for permitting said thermal energy to be absorbed by said fluid;

e. absorber means comprising a substantially planar tubular coil for conveying said fluid carried on said open end of said pipe opposite to said open end for receiving said radiation waves therethrough; said absorber means including a coated surface having a high absorption factor for absorbing the visible portion of the electromagnetic radiation spectrum of said radiation waves and for conversion of said radiation waves into thermal energy;

f. said tubular coil encircling said light pipe being connected to said coil of said absorber means;

g. whereby the light pipe acts as a trap, directing the visible portion of the electromagnetic radiation spectrum to said absorber means for conversion therein to thermal energy to be absorbed by said fluid conveyed in heat exchange relationship with said absorber means.

3,958,554

SOLAR COLLECTOR HAVING OXYGEN-DEFICIENT PbO_2 COATING

Ferenc J. Schmidt, Ardmore, Pa., assignor to Ametek, Inc., New York, N.Y.

Filed July 2, 1974, Ser. No. 485,246

Int. Cl.² F24J *3/02*; F28F *21/00*

U.S. Cl. 126—271 **8 Claims**

1. A solar energy collector system comprising a heat transfer member, a surface coating of oxygen-deficient PbO_x on said member, means feeding fluid into heat transfer relation to said member, and means for feeding fluid from said member to a zone of utilization.

3,958,555

FLUID SUPPLY SYSTEMS

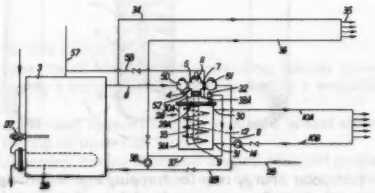
Alexander Dewar Horne, Johnstone, Scotland, assignor to The Horne Engineering Co., Ltd., Johnstone, Scotland

Filed Sept. 23, 1974, Ser. No. 508,267

Claims priority, application United Kingdom, Sept. 29, 1973, 45638/73; Jan. 18, 1973, 48480/73; Nov. 9, 1973, 52058/73; Nov. 24, 1973, 54636/73

Int. Cl.² F24H *1/22*

U.S. Cl. 126—362 **13 Claims**



1. A recirculation fluid supply system for the supply of temperature blended fluid to a draw-off comprising:

a. a thermostatic blending valve having:

i. hot and cold inlets for receiving relatively hot and cold fluids respectively from supply sources;

ii. a mixing portion wherein mixing of the hot and cold fluids occurs;

iii. a temperature control portion receiving blended fluid from the mixing portion and including a thermostat;

iv. valve means operable by the thermostat to regulate the openings of the hot and cold inlets; and

v. a blended fluid discharge from the temperature control portion;

b. a supply conduit connected to the blended fluid discharge of the blending valve for the supply of temperature blended fluid to the draw-off;

c. return conduit means for recirculating the bulk of the temperature blended fluid from the draw-off to the thermostat of the blending valve when the draw-off is closed so that the thermostat of the blending valve is responsive to the temperature of the recirculated blended fluid;

d. means for pumping the blended fluid in the supply conduit and in the return conduit means; and

e. temperature control means to maintain the temperature of the recirculated blended fluid at the desired draw-off temperature whereby the thermostat responsive to the recirculated fluid temperature operates to set the valve means of the blending valve for delivery of blended fluid by the valve at the desired draw-off temperature when the draw-off is re-opened.

11. A calorifier unit for use in a fluid recirculation supply system supplying a draw-off, the unit comprising a vessel having a fluid outlet adapted for connection to a conduit delivering fluid to the draw-off and a fluid inlet adapted for connection to a return conduit from the draw-off; a thermostatic blending valve mounted on the vessel and having inlets for hot and cold liquids to be blended, a discharge for blended liquid discharging into the vessel, and a temperature responsive element controlling the blended liquid temperature located in the vessel to be responsive to the temperature of the fluid therein; fluid heating means projecting into the vessel, and a temperature controller for the fluid heating means carried by the vessel and controlling the operation of the heating means to maintain the temperature of liquid in the vessel at a predetermined value.

3,958,556

CLOSURE MEANS FOR ARTIFICIAL RECTAL OPENINGS

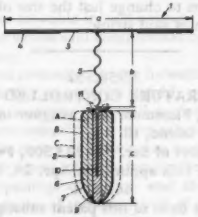
Wolfgang Schenk, 111 Rheinstrasse, 62 Wiesbaden, Germany

Filed July 18, 1974, Ser. No. 489,601

Claims priority, application Germany, July 14, 1973, 2335858

Int. Cl.² A61B *19/00*

U.S. Cl. 128—1 R **7 Claims**



1. Device for the temporary closing of an artificial anus, comprising a flexible closing plug which is adapted to be introduced into the lumen of the artificial anus and a flangetype abutment portion which is adapted to be placed on the outside of the body adjacent the anus, generally on the abdominal wall of the user; the characteristics of which device are:

a. that the said abutment portion is a leakproof carrier in the form of a flexible synthetic plastic sheet having on the side that is to face the body an annular region of adhesive material agreeable to the human skin and adapted to hold the device in place on the user's body while sealing against escape of fluid from the anus, and a projecting generally helical mounting pin, said flexible sheet and said mounting pin being connected together as a unit; and

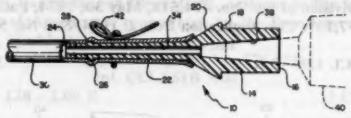
b. that the said closing plug is in the form of a tampon of absorbent material of suitable size mounted on said pin to complete the assembly for use, and the said closing plug has a core of firmer material than the tampon surrounding it, said pin being screwed into said core in assembling the device for use.

3,958,557

CORONARY ARTERY BYPASS GRAFT TESTING DEVICE AND METHOD

Russell G. Sharp, Sugar Land; Denton A. Cooley, and Charles C. Reed, both of Houston, all of Tex., assignors to Texas Medical Products, Inc., Houston, Tex.

Filed Mar. 10, 1975, Ser. No. 556,613
Int. Cl.² A61B *19/00*; A61F *1/24*
U.S. Cl. 128—1 R **6 Claims**



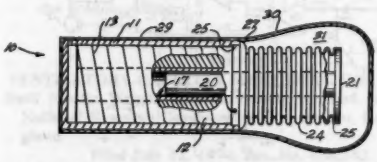
1. A coronary artery bypass graft proving device comprising:
an elongated hollow stylet fabricated from a material having suitable flexibility and softness to prevent trauma to the intima of a vein, the stylet having a blunt end and being adapted to be telescopically inserted within a portion of the vein;
an annular raised flange situated intermediate the insertable length of the stylet, the flange having a rearwardly tapering ramp surface to facilitate insertion of the stylet and flange into a vein segment, the flange terminating in a flange shoulder thereby serving to engage the interior of the vein to facilitate fluid-tight ligation of the vein on the stylet;
a frustoconical body forming a ramp against which the end of the vein is pressed, the ramp being integral with and tapering away from the stylet, the ramp extending outwardly to a diametrally enlarged body shoulder, the body terminating in a diametrally reduced, cylindrical coupling member, the body shoulder forming an abutment surface for tubing placed on the coupling member; and
a female Luer fitting interior of the body.

3,958,558

IMPLANTABLE PRESSURE TRANSDUCER

Roderick R. Dunphy, San Jose; Leo A. Bullara, Glendora, and Robert H. Pudenz, Pasadena, all of Calif., assignors to Huntington Institute of Applied Medical Research, Pasadena, Calif.

Filed Sept. 16, 1974, Ser. No. 506,217
Int. Cl.² A61B *5/02*
U.S. Cl. 128—2 P **7 Claims**



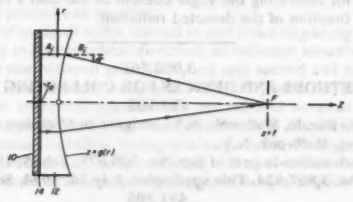
1. An implantable pressure transducer, comprising:
an elongated housing having an axis of elongation;
a capacitor assembly mounted in the housing;
an inductor assembly mounted in the housing and connected across the capacitor assembly to form a resonant L-C circuit;
one of the assemblies being of coaxial form and including an axially movable element for varying the reactance thereof, the element being movable along the axis of elongation;
a pressure-sensitive bellows secured and sealed to one end of the housing and effective to generate a displacement in response to applied pressure;
means connecting the bellows and the axial movable element whereby bellows displacement resulting from applied pressure is transmitted by the connecting means to move the element and thereby vary the resonant frequency of the L-C circuit in response to applied pressure, said resonant frequency being externally detectable by wireless transmission of electromagnetic energy between external equipment and the implanted transducer to provide data analogous to pressure; and
a flanged plug secured to an end of the housing opposite the end on which the bellows is mounted;
the transducer being free of external wired connections and having outer surfaces formed of materials suitable for human implantation, the inductor and capacitor assemblies being isolated within the housing against contact with biological material in which the transducer is implantable.

3,958,559

ULTRASONIC TRANSDUCER

William E. Glenn, Stamford, and Anant K. Nigam, Fairfield, both of Conn., assignors to New York Institute of Technology, Old Westbury, N.Y.

Filed Oct. 16, 1974, Ser. No. 515,352
Int. Cl.² A61B *10/00*; H01L *41/10*
U.S. Cl. 128—2 V **9 Claims**



1. Apparatus for producing a spot of focussed ultrasonic energy while diminishing undesired side lobes outside the spot, comprising:
a transducer for generating ultrasonic energy having some non-uniformity due to finite transducer size;
a curved focusing lens operatively coupled to said transducer for focusing said ultrasonic energy at a spot on the axis of said lens;
said lens being formed of a material which apodizes said ultrasonic energy by attenuating each ray of said energy passing therethrough in proportion to the lens thickness traversed by said ray, such that the attenuated energy combines at the focal plane to cause cancellation of side lobes outside said spot.

3,958,560

NON-INVASIVE AUTOMATIC GLUCOSE SENSOR SYSTEM

Wayne Front March, 2517 Rugby Road, Dayton, Ohio 45406

Filed Nov. 25, 1974, Ser. No. 526,581
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—2 A **12 Claims**

1. A non-invasive glucose sensor system for determining the sugar content in the user's blood,

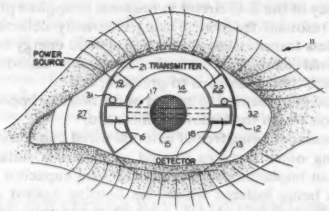
said system comprising radiation source means for emitting radiation of certain wave lengths,

said certain wave lengths being altered by sugar derivatives,

radiation detecting means for detecting said certain wave lengths,

power source means for providing power to said radiation source means and said radiation detecting means,

mounting means for mounting said radiation emitting means and radiation detecting means spaced apart from each other, but in line with each other, so that the radiation detecting means receives the certain wave lengths of the radiation source means, the distance said radiation source



means and said radiation detecting means are spaced apart being at least equal to the diameter of the cornea of the human eye,

said mounting means being adapted to be fitted contiguous to a user's eye with said radiation source means and radiation detecting means at opposite sides of the cornea of the human eye so that said radiation of said certain wave lengths passes through the cornea of the user's eye in going to the radiation detecting means, and

said radiation detecting means comprising indicator means for indicating the sugar content of the user's blood as a function of the detected radiation.

3,958,561

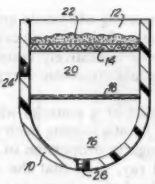
METHODS AND DEVICES FOR COLLECTING BODY FLUIDS

Louis Bucalo, Holbrook, N.Y., assignor to Microbyx Corporation, Holbrook, N.Y.

Continuation-in-part of Ser. No. 329,671, Feb. 5, 1973, Pat. No. 3,867,924. This application July 24, 1974, Ser. No. 491,506

Int. Cl.² A61B *10/00*

U.S. Cl. 128—2 F **11 Claims**



1. In a method for collecting and analyzing body fluids, the steps of introducing into a body cavity where the body fluid is present a device having an interior for receiving and holding the body fluid and also having a passage means which restricts the flow of the fluid to said hollow interior by a predetermined extent so that the fluid received in said hollow interior will have characteristics determined by the extent of restriction of flow provided by said passage means, and after said device has remained in said cavity for a length of time sufficient for the body fluid to be received in said hollow interior removing the device from the body cavity and thereafter testing the body fluid received in said hollow interior, the device having a plurality of interior portions respectively communicating through passage means of different degrees of restriction with the fluid so that the different interior portions will have fluid of different characteristics, each passage means and interior portion communicating therewith being in the form of a separate tube having an inner collecting end forming the hollow interior, and pinching said tube after fluid has been collected in a hollow interior communicating therewith so that the pinched tube with the fluid in the hollow interior space communicating therewith can be delivered to a location where the fluid can be tested.

3,958,562

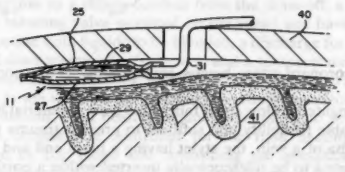
IMPLANTABLE PRESSURE SENSOR

Salomon Hakim, Bogota, Colombia, and Donald L. Harris, Miami Beach, Fla., assignors to Hakim Company Limited, Saint Vincent, British W. Indies

Division of Ser. No. 474,518, May 30, 1974, Pat. No. 3,877,137. This application Dec. 2, 1974, Ser. No. 528,661

Int. Cl.² A61B *5/00*

U.S. Cl. 128—2 R **3 Claims**



1. An implantable pressure sensor comprising:

a silicone rubber vessel the walls of which include wax trapped within the silicone rubber, the silicone rubber completely encasing the wax;

within said vessel, a filling of a non-toxic hydraulic fluid which is compatible with body fluids; and

coupled to said vessel, means for accomodating fluid displaced from said vessel when said vessel is subjected to pressure.

3,958,563

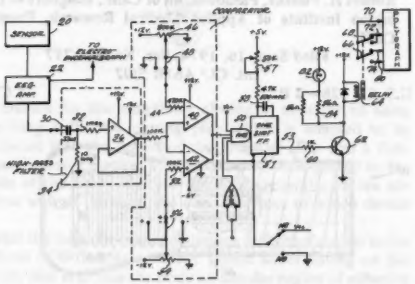
TWO SPEED SYSTEM FOR EEG RECORDING

Heriberto Fernandez, 1822 Gaston St., Winston-Salem, N.C. 27103, and George T. Pardue, P.O. Box 131, Pilot Mountain, N.C. 27041

Filed Nov. 6, 1974, Ser. No. 521,401

Int. Cl.² A61B *5/04*

U.S. Cl. 128—2.1 B **16 Claims**



1. A system for recording EEG electrical body waveforms comprising:

means for detecting an EEG waveform and producing an electrical signal representing said waveform,

means for comparing the amplitude of said electrical signal with a predetermined amplitude level and producing a trigger signal when said amplitude of said electrical signal exceeds said predetermined level,

means responsive to said electrical signal for producing a graphical representation of said waveform on a strip of recording material,

means for driving said strip of recording material past said representation producing means, and

means for causing said driving means to change the speed at which said recording material is driven from a first speed to a second speed higher than said first speed when said comparing and producing means produces said trigger signal.

3,958,564

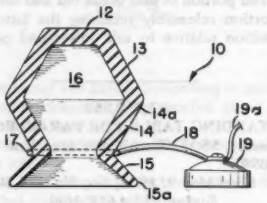
EKG CONTACT

Arthur F. Langguth, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 9, 1975, Ser. No. 576,080

Int. Cl.² A61B *5/04*

U.S. Cl. 128—2.06 E **3 Claims**



1. An apparatus located on the body of a living animal for sensing electrical potentials therein comprising:

means having an outwardly reaching member for electrically coupling the electrical potentials to remote circuitry, the electrically coupling means further includes a ring shaped member coupled to the outwardly reaching member and

means coupled to the outwardly reaching member for holding the electrically coupling means firmly against the animal's body, the holding means having a lip portion for sealingly engaging the animal's body, an annular shoulder portion for forcing the outwardly reaching portion toward the animal's body to ensure the firm holding of the electrically coupling means thereon, a frustoconically shaped shell portion interconnecting the lip portion and the annular shoulder portion and a cup shaped shell portion mounted on the annular shoulder portion to define a continuously extending chamber, the ring shaped member is carried on the outside of the holding means where the lip portion is joined to the frustoconically shaped shell portion to ensure the firm holding of the electrically coupling means irrespective of its radial orientation from the holding means.

3,958,565

VENTILATORY CAPACITY MEASURING INSTRUMENT

Basil Martin Wright, Rickmansworth, England, assignor to National Research Development Corporation, London, England

Filed July 12, 1974, Ser. No. 488,243

Claims priority, application United Kingdom, July 17, 1973, 33934/73

Int. Cl.² A61B *5/08*

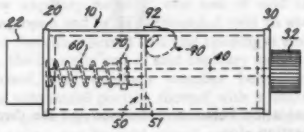
U.S. Cl. 128—2.08 **3 Claims**

1. A ventilatory capacity measuring instrument for measuring the maximum flow rate of a single forced expiration, comprising:

a hollow cylindrical body;

first and second apertured end members connected in respective ends of said body, with at least one of said members being separable from said body; a hollowed mouthpiece connected with said first end member to extend outwardly therefrom relative to said body, and communicated with the hollow of said body by way of the aperturing of said first end member; a rod respectively connected at its ends with said end members extending coaxially within said body;

an annular piston slidably mounted on said rod and wholly confined within said body;



a constant rate spring operably connected between said piston and body, in the annular space between said body and rod, to apply a linearly increasing bias against movement of said piston from said first end member towards said second end member;

a slot of uniform width formed in and extending along said body in a longitudinal direction; an indicator mounted in said slot between said piston and said second end member, and separably engaged with said piston for movement therewith towards said second end member but separate movement towards said first end member, said indicator including spring retaining means for engaging the parts of said body bordering said slot; and

a non-linear scale extending along said body alongside said slot.

3,958,566

SUCTION CONTROL DEVICE FOR AN ENDOSCOPE

Hiroyuki Furihata, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 23, 1974, Ser. No. 500,162

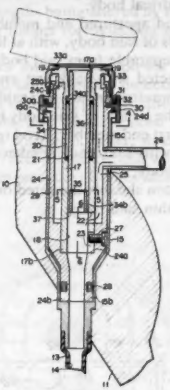
Claims priority, application Japan, Aug. 27, 1973, 48-100395[U]; Sept. 25, 1973, 48-111592[U]

Int. Cl.² A61B *1/00*

U.S. Cl. 128—4 **9 Claims**

1. A suction control device comprising: an endoscope having a body, a cylindrical insertion pipe having a through bore interiorly thereof and extending substantially in axial direction of said pipe, the lower end of said through bore communicating with a channel extending interiorly of said endoscope body and the upper end thereof being open to the exterior, said insertion pipe having an upper end opening portion with a shape permitting the end portion of an injection instrument to be inserted thereinto, a wall member surrounding at least partially the outer circumference of said insertion pipe and defining a closed space with said insertion pipe, a suction pipe, said space communicating with said suction pipe and having an upper end opening portion substantially flush with said

upper end opening portion of said insertion pipe, and opening means formed in the insertion pipe for selectively establishing



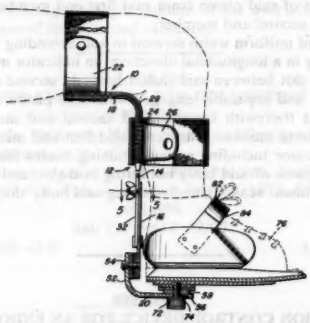
communication between said space and the through bore of said insertion pipe.

3,958,567

DEROTATION BRACE FOR TIBIA DEFORMITIES

George R. Callender, Jr., 4701 MacCorkle Ave., SE., Charleston, W. Va. 25304

Filed Apr. 29, 1975, Ser. No. 572,923
Int. Cl.[2] A61F 3/00
U.S. Cl. 128—80 R 3 Claims



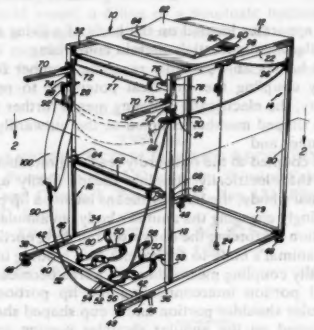
1. A derotation leg brace for treatment of internal torsion or external torsion of the tibia bone comprising a rigid strap-type vertical brace bar having upper and lower end portions as well as front and rear sides and adapted to extend along the posterior of the calf portion of the leg of a user, said upper end portion including an integral rearwardly directed angulated strap-type upper terminal end portion adapted to underlie the underside of the thigh portion of said leg with the knee of the user bent to conform to the relative angulation of said brace bar and upper terminal end portion, said upper terminal end portion being joined to said upper end portion by means of a trasversely extending generally quarter cylindrical connecting portion integral with said upper end portion and terminal end portion, projecting outwardly of the opposite sides thereof and adapted to cushion and protect the popliteal fossa of the user, said upper terminal end portion and said upper end portion of said brace bar including transverse integral upwardly and forwardly opening rigid U-shaped leg cradles, respectively, adapted to cradle the thigh and calf portions, respectively, of the user, each of said cradles including adjustable strap means operatively associated therewith for clamping the corresponding leg portion in the ssociated cradle, the lower end portion of said brace bar including a forwardly directed angulated lower terminal end portion, an upwardly opening shoe cradle for cradling the shoe of the user of said brace supported from a forward portion of said lower terminal end portion for adjustable angular displacement of said shoe cradle relative to said lower terminal end portion about an upstanding axis fixed relative to said lower terminal end portion and generally paralleling and spaced forward of said brace bar, said shoe cradle including a lower plate for resting the sole of an associated shoe thereon and means for substantially stationarily anchoring a shoe therein with the sole of the shoe abutted against the lower plate, said upper and lower end portions being slidingly overlappingly engaged with each other for limited guided relative longitudinal extension and retraction, means connected between said upper and lower end portions releasably retaining the latter in infinite relative adjusted positions within the limits thereof, means supporting said lower terminal end portion from said lower end portion of said brace bar for adjustable swinging about a front to rear extending axis spaced above said lower plate and said lower terminal end portion and stationary relative to the latter, means connected between said lower end portion of said brace bar and said lower terminal end portion releasably retaining the latter in adjusted rotated position relative to said lower end portion of said brace bar.

3,958,568

STANDING TABLE FOR PARAPLEGICS

Jerry C. Gaddy, 55 W. Washington Ave., Unit C37, Yakima, Wash. 98902

Filed May 9, 1975, Ser. No. 576,203
Int. Cl.[2] A61F 3/00
U.S. Cl. 128—80 R 11 Claims



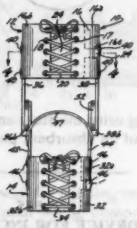
1. A standing table for paraplegics, said table including an upper top having a first marginal edge portion and a pair of upright supportive legs spaced along said marginal edge portion and from whose upper ends said top is supported, foot stall defining means anchored relative to said legs and adapted to rest upon a support surface upon which the lower ends rest, a generally knee height transverse brace extending between and supported from said legs below said top, and an elongated at least somewhat flexible waist restraint member anchored at one end portion relative to the upper end portion of one of said legs above said transverse brace, the other end portion of said restraint member and said table including coacting means operative to releasably anchor the other end portion of said restraint member relative to the upper end portion of the other of said legs above said transverse brace, said restraint member being of a length to hang downwardly from said one end portion to a level at least closely adjacent the lower ends

of said legs and then extend upwardly to the upper end portion of said other leg, said coacting means including means operative to anchor portions of said other end portion spaced indiscriminately therealong relative to said other leg.

3,958,569
KNEE PROTECTOR AND BRACE

Arthur E. Vosburgh, 1245 Brown Road, Ellwood City, Pa. 16117

Filed May 19, 1975, Ser. No. 578,386
Int. Cl.² A61F 3/00
U.S. Cl. 128—80 C **5 Claims**

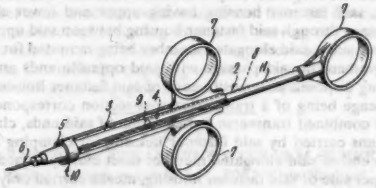


1. A knee protector and brace, comprising in combination,
a thigh member adapted to be secured about a person's thigh above the knee,
a calf member adapted to be secured about a person's calf below the knee,
a pair of arms extending from each of said members toward the knee but on opposite sides thereof,
and means forming a pivotal connection between the arms on each side of the knee extending from said thigh and calf member respectively, each of said pivotal connections including a washer between the respective arms, a circular hub inserted within a through opening in one of the said arms and means securing the other of said arms to said washer.

3,958,570
SYRINGES AND SYRINGE CAPSULES

Joseph H. Vogelman, 48 Green Drive, Roslyn, N.Y. 11576, and Norman Orentreich, 140 E. 72nd St., New York, N.Y. 10021

Filed Sept. 3, 1974, Ser. No. 502,599
Int. Cl.² A61M 5/00
U.S. Cl. 128—218 DA **11 Claims**

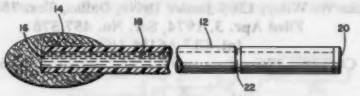


1. A syringe comprising:
a resilient plastic barrel having a predetermined inner diameter; and
received in the barrel a plunger having a metal core of lesser diameter than the inner diameter of the barrel and a coating of a resilient, low friction material, the diameter of the coating being greater than the barrel's inner diameter, the plunger being manually slidable in the barrel, the coating extending continuously along the plunger from the distal end of the plunger to at least that part of the plunger most remote from the distal end but received in the barrel when the plunger is slid down to the bottom of the barrel, whereby the syringe is adapted to exert high pressure without leakage.

3,958,571
SWAB APPLICATOR

William E. Bennington, 5 Fillmore Drive, Sarasota, Fla. 33578

Filed Aug. 22, 1973, Ser. No. 390,404
Int. Cl. A61M 35/00
U.S. Cl. 128—269 **12 Claims**

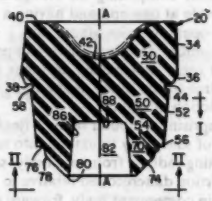


1. A swab applicator comprising a structurally firm, elongated, hollow capillary member, one end of said capillary member being open and being surrounded with an absorbent swab secured thereto, wherein said end opening is embedded in said swab, the opposite end of said capillary member being normally closed, said capillary member being prefilled throughout a substantial portion thereof with a usable solution, said solution being retained within said capillary member by capillary action and by said closed end, opening means disposed at said closed end for easy opening of said closed end, whereby upon opening, pressure is equalized at both ends of said capillary member, and whereby a substantial portion of said solution will drain into said swab and be absorbed therein.

3,958,572
BLOOD COLLECTING AND SEPARATING ASSEMBLY STOPPER

Creighton M. Lawhead, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 16, 1974, Ser. No. 532,828
Int. Cl.² A61J 1/00
U.S. Cl. 128—272 **2 Claims**



1. A stopper assembly for use in combination with a tubular blood collection and separation container having cylindrical sidewalls defining a longitudinal axis and provided with an open end portion comprising, a removable stopper including a flange portion having means for engaging said open end portion of said container in a plane substantially normal to the longitudinal axis of the cylindrical sidewalls thereof, a frustoconical plug portion integrally depending from said flange portion having lateral face means of greater diameter than the inner diameter of said sidewalls for sealingly engaging said sidewalls in a fluid and vacuum tight relationship, said plug portion tapering inwardly away from said flange portion and terminating at an annular band extending radially inwardly from said lateral face means in a plane lying normal to said longitudinal axis, a nose portion depending from said plug portion and bounded at its juncture with said plug portion by an inner circumference of said annular band, said nose portion including a lateral face of a frustoconical shape which tapers inwardly in a direction projecting away from said annular band and an inner face of a generally frustoconical shape which tapers inwardly within said nose and plug portions in a

direction projecting toward said flange portion, and said annular band providing means for spacing said nose portion radially inwardly away from the inner surface of said sidewalls to thereby facilitate during centrifugation the flow of blood components away from said sidewalls and across said annular band toward said frustononical lateral face of said nose portion.

3,958,573
ASPIRATOR APPARATUS
Corless W. Wiley, 1505 Junior Drive, Dallas, Tex. 75208
Filed Apr. 3, 1974, Ser. No. 457,576
Int. Cl.² A61M *1/00*
U.S. Cl. 128—276 **6 Claims**

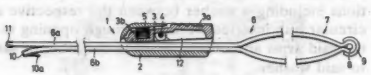
1. Aspirator apparatus comprising
an elongated tubular member including an adaptor tip at one end; said adaptor tip having a smaller diameter portion at its distal end, and having an axially extended, cylindrical enlargement spaced from said distal end; said smaller diameter portion including a tapered portion reducing in diameter toward its end, and adapted to be received and retained in a small diameter resilient flexible conduit;
a tubular adaptor, having a slightly tapered internal bore dimensioned in relation to said cylindrical enlargement for frictional coupling therewith; said adaptor having an outer diameter adapted to be received and retained in a large diameter flexible conduit, and having an external radial flange at one end; said tapered bore being larger at the flanged end of said adaptor and smaller at the opposite end;
a tip component comprising an elongated tubular body, having a nozzle at one end and having a longitudinal slot in one wall opening to its other end;
said tubular member defining a base component; said tubular member other end having an inner diameter dimensioned relative to the outer diameter of said tip body for a mating friction coupling;
a plunger comprising a tubular body, a flexible stylette fixed to one end of said body to extend into said nozzle, and a boss projecting radially from said body; said plunger body having a portion dimensioned relative to the inner diameter of said tip component body, forward of said longitudinal slot, for a sliding sealing fit therewith; said plunger body having an end portion, remote from said stylette, dimensioned relative to the inner diameter of said base component for a sliding sealing fit therewith;
said plunger body, in assembly, disposed with said boss projecting through said tip component slot, whereby said plunger is reciprocable by said boss to reciprocate said stylette relative to said nozzle; and said plunger body defining a conduit to bridge said slot.

3,958,574
MASCULINE HYGIENE DEVICE
Joan M. Rohr, 71 Grotto Ave., Providence, R.I. 02906
Filed Sept. 30, 1974, Ser. No. 510,415
Int. Cl.² A61F *5/44*
U.S. Cl. 128—295 **2 Claims**

1. A one use masculine hygiene disposable device to be stored in a container adjacent the point of use comprising a self-supporting cup having an arcuate end wall and a continuous side wall and of a size to receive the end of the male penis, said cup having an open edge and an integral tab extending from the open edge of said cup, said tab being of a size to be grasped by the hand, said cup being completely of a material

capable of absorbing urine moisture and said material being of a plurality of plies of an absorbent paper.

3,958,575
CONSTRICTING DEVICE FOR INCREASING PRESSURE ON HUMAN AND ANIMAL BODIES
Ferdinand Freiherr Von Soiron, Cologne, Germany, assignor to Prameta Prazisionsmetall-und Kunststofferzeugnisse G. Baumann & Co., Cologne, Germany
Filed Aug. 20, 1974, Ser. No. 498,963
Claims priority, application Germany, Aug. 23, 1973, 2342490
Int. Cl.² A61B *17/12*
U.S. Cl. 128—327 **4 Claims**



1. A constricting device for increasing pressure in humans or animals comprisng an elongated member of flexible material having opposite ends, said elongated member being looped upon itself to dispose the ends thereof adjacent each other and dispose a loop remote therefrom, a fastener housing, said fastener housing having upper and lower sides, a passage through said fastener housing between said upper and lower sides, said elongated member being mounted for sliding movement in said passage with said opposite ends and loop being disposed at opposite ends of said fastener housing, said passage being of a transverse cross-section corresponding to the combined transverse cross-section of said ends, clamping means carried by said fastener housing for clamping against the end of said elongated member most closely adjacent said upper side of said fastener housing, means carried only by the end of said elongated member most closely adjacent said lower side of said fastener housing for abutting against said fastener housing to prevent said last-mentioned end from being drawn through said passage in a direction toward said loop, the end of said elongated member most closely adjacent said upper side of said fastener housing being devoid of means for abutting said fastener housing whereby only said last-mentioned end can pass completely through said passage in a direction toward said loop and said means carried by said end of said elongated member most closely adjacent said lower side of said fastener housing including a tongue having a terminal end directed downwardly and away from said lower side of said fastener housing.

3,958,576
SURGICAL INSTRUMENT FOR CLIPPING ANY AFFECTED PORTION OF A BODY CAVITY

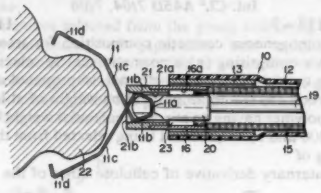
Osamu Komiya, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1974, Ser. No. 523,071

Claims priority, application Japan, Nov. 14, 1973, 48-130727[U]

Int. Cl.² A61B *17/08, 17/10*

U.S. Cl. 128—346 **12 Claims**



1. A surgical instrument for clipping any affected portion of a body cavity of a human being, comprising a clip member formed into a substantially figure "eight" shape and having a rear end portion, a pair of offset portions having one end connected to the rear end portion and the other end extending away from the longitudinal axis of the clip member, a pair of portions respectively connected at one end to the opposite ends of the offset portions and intersecting each other, and a pair of clamping portions respectively connected to the opposite ends of the intersecting portions; an instrument body through an interior of which the clip member is introduced into the body cavity; a hook member mounted within the instrument body so as to anchor the rear end portion of the clip member; first actuating member for moving the hook member anywhere between a first position in which the hook member is exposed and a second position in which the hook member is retracted within the instrument body; engaging means adapted to be forcefully engaged with the offset portions of the clip member, when the hook member is retracted a predetermined distance from the first position, to cause the offset portions to be urgingly compressed to move the clamping portions of the clip member to an opened position, adapted to be forcefully engaged with the intersecting portions of the clip member, when the hook member is further retracted by the first actuating means, to cause the clamping portions of the clip member to be closed to clip the affected portion of the body cavity, and adapted to be left, together with the clip member within the body cavity when the clip member associated therewith is separated from the instrument body; and second actuating means for moving the engaging means relative to the hook member anywhere between a first position in which the engaging means is exposed and a position in which the engaging means is retracted.

3,958,577
APPARATUS FOR TREATMENT WITH SUM CURRENTS

Hans Rodler, Karntnerstrasse 161, 8053 Graz-Neuhart, Austria

Filed Nov. 21, 1972, Ser. No. 308,344

Claims priority, application Austria, Nov. 22, 1971, 10037/71

Int. Cl.² A61N *1/36*

U.S. Cl. 128—420 A **6 Claims**

1. An apparatus for producing interference and beat-currents in a selectable point of the body, particularly for electrotherapy on the human body, comprising

at least two circuits having two pairs of electrodes, respectively, adapted to be applied to the human body,

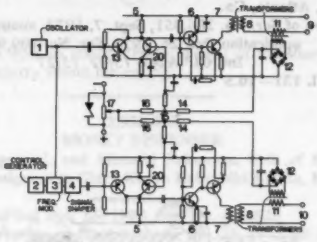
said circuits each having a controllable output amplifier means controlling its output currents by controlling its amplification and for maintaining the output currents at a constant value, each of said output amplifiers being operatively connected to one of said pairs of electrodes,

means connected to said amplifier means for supplying independently both pulsed and alternating current to said pairs of electrodes,

sensing means operatively connected to each of said pairs of electrodes for providing an individual voltage proportional in amplitude to current flowing through the patient,

means for providing a common setting voltage,

common controller means connected to said amplifier means for controlling the amplification thereof, said



controller means receiving said voltages for mathematically relating each of said individual voltages with said common setting voltage and for producing a difference voltage separately for each of said circuits,

said controller means including means for polarizing said difference voltage such that an increase in current through each pair of electrodes and said patient decreases the amplification of the respective amplifier means and for increasing the amplification thereof upon an increase in said common setting voltage,

said amplifier means including means for controlling each other to produce equal output currents.

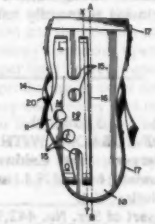
3,958,578
ANTI-PRONATING DEVICE

Ross A. Tennant, 10 N. Main St., Newmarket, N.H. 03857

Continuation-in-part of Ser. No. 165,666, July 23, 1971, abandoned. This application Feb. 27, 1975, Ser. No. 553,686

Int. Cl.² A61F *5/14*

U.S. Cl. 128—585 **8 Claims**



1. An anti-pronation exercising device adapted to be secured to a user's foot, said device comprising a base portion adapted to lie generally coextensive laterally with the width of the user's foot and coextensive longitudinally from the heel to at least the ball of the user's foot and having upper and lower surfaces;

a balance bar mounted on the said lower surface of said base portion and positioned to the outside of the centered longitudinal axis of the said base portion;

the said balance bar having a bottom weight supporting surface which has a longitudinally extending inner edge substantially aligned with said longitudinal axis and about which edge said device may pivot as the user's foot is pronated while standing thereon;

and means for attaching said device firmly in relation to the sole of the user's foot.

3,958,579

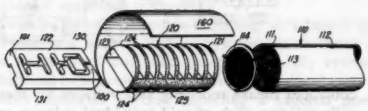
CIGARETTE FILTER

Jack C. Baker, Atlanta, Ga., assignor to Baker-Alpha Corporation, Atlanta, Ga.

Division of Ser. No. 286,851, Sept. 7, 1972, abandoned. This application Oct. 26, 1973, Ser. No. 409,900

Int. Cl.² A24B *15/02, 15/27*

U.S. Cl. 131—10.5 **7 Claims**



1. In a filtered cigarette of the type wherein tobacco is contained in a sheath in the forward portion of the cigarette, the distal end of which is lighted so that the smoke will be drawn through the tobacco and the proximal end of the cigarette into the rear portion of the cigarette by the person smoking the cigarette, the combination therewith of a filter in the rear portion of said cigarette, said filter being characterized by:

a. a flat wafer core having a passageway leading from the distal end of said core to its proximal end along the surface of said flat wafer core with said passageway including a maze of individual outwardly opening channels recessed along one surface of said flat wafer core arranged so as to split the smoke into diverging streams and so as to recombine the split smoke streams into a single stream; and

b. a cover for closing outwardly and outwardly opening channels.

3,958,580

TREATMENT OF TOBACCO WITH ASCORBIC ACID

William Joseph Mergens, West Caldwell, and Harold Leon Newmark, Maplewood, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 442,990, Feb. 15, 1974, abandoned. This application Mar. 25, 1975, Ser. No. 561,816

Int. Cl.² A24B *15/02*

U.S. Cl. 131—17 R **8 Claims**

1. A method for the reduction of nitrogen dioxide content in tobacco smoke which comprises passing said smoke through uncombusted tobacco having dispersed therein an effective amount of a substance selected from the group consisting of a pharmaceutically acceptable salt of ascorbic acid or erythorbic acid, or mixtures of said salts with their respective acids wherein the molar ratio of acid to salt does not exceed about 3:1.

3,958,581

COSMETIC COMPOSITION CONTAINING A CATIONIC POLYMER AND DIVALENT METAL SALT FOR STRENGTHENING THE HAIR

Jean-Louis Abegg; Jean-Pierre Bolteux, both of Paris, and Colette Hourseau, Herblay, all of France, assignors to L'Oreal, Paris, France

Continuation-in-part of Ser. No. 361,329, May 17, 1973, abandoned. This application Oct. 15, 1974, Ser. No. 515,074

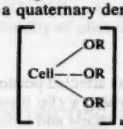
Claims priority, application Luxemburg, May 17, 1972, 65373

Int. Cl.² A45D *7/04, 7/06*

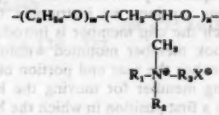
U.S. Cl. 132—7 **11 Claims**

1. A homogeneous cosmetic composition for treating degraded hair comprising (a) a cosmetic vehicle selected from the group consisting of water, ethanol, isopropanol and mixtures thereof; (b) 0.2 to 25 percent by weight of at least one cationic polymer having an average molecular weight between about 1,000 and 3,000,000 and being selected from the group consisting of

i. a quaternary derivative of cellulose ether of the formula

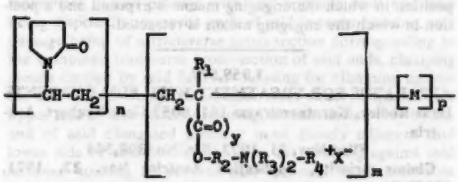


wherein Cell represents the residue of an anhydroglucose unit, y represents a whole number between about 50 and about 20,000 and each R, identical or different, represents a group of the formula

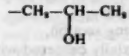


wherein *a* and *b* are 2 or 3; *c* is 1, 2 or 3; *m* and *p* are whole numbers from 0–10; *n* is a whole number from 0–3; *q* is 0 or 1; R_1, R_2 and R_3 each independently represent a member selected from the group consisting of alkyl, aryl, aralkyl, alkaryl, alkoxyalkyl and alkoxyaryl, said member containing up to 10 carbon atoms and such that the sum of the number of carbon atoms of R_1, R_2 and R_3 ranges from 3–12, with the proviso that when any one or more of R_1, R_2 and R_3 is alkoxyalkyl at least two carbon atoms separate the oxygen of the alkoxy moiety from the nitrogen to which the alkyl moiety is attached; and X^- represents the anion of a mineral or or organic acid;

ii. polymer of the formula



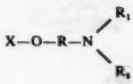
wherein *n* is a whole number between 20–99, *m* is a whole number between 1 and 80 and *p* is a whole number between 0 and 50, with $n+m+p=100$; $y=0$ or 1; R_1 represents a member selected from the group consisting of hydrogen and methyl; R_2 represents a member selected from the group consisting of



and C_xH_{2x} wherein x is a whole number between 2 and 18; R_3 is selected from the group consisting of methyl, ethyl and tert-butyl; R_4 is selected from the group consisting of methyl, ethyl and benzyl; $X^{\ominus}$ represents a member selected from the group consisting of chloride, bromide, iodide, sulfate, bisulfate and CH_3SO_3; and M represents a vinyl monomer copolymerizable with N-vinyl pyrrolidone;

iii. a member selected from the group consisting of (1) the polycondensate of piperazine and epichlorohydrin wherein the molar proportion of piperazine to epichlorohydrin ranges from 0.5:2 to 2:0.5, and (2) the quaternary ammonium salt of the polycondensate of (1);

iv. polymer of the formula



wherein X representz the residue of a starch molecule, R is selected from the group consisting of alkylene and hydroxy alkylene, wherein the alkylene of each contains from 2 to 5 carbon atoms and R_1 and R_2 are alkyl containing 1 to 5 carbon atoms, phenyl and phenyl alkyl wherein the alkyl moiety contains from 1 to 5 carbon atoms; and

v. a member selected from the group consisting of (1′) a copolymer of 43–16 weight percent methyl methacrylate, 54–25 weight percent dimethylaminoethyl methacrylate and 12–52 weight percent octadecyl methacrylate, and (2′) the quaternary ammonium salt of the copolymer of (1′); and

(c) 0.01 – 0.5 mole per gram of said cationic polymer of a non-toxic salt of a divalent metal selected from the group consisting of the carbonate, silicate, nitrate, acetate, gluconate, pantothenate and lactate of calcium, magnesium, manganese, iron, strontium, zinc and cadmium.

9. A process for treating degraded hair so as to improve its mechanical stability comprising applying to said hair the composition of claim **1** in an amount effective to improve its mechanical stability.

10. The process of claim **9** which includes subsequent to the application of said composition to said hair, rinsing and drying said hair.

3,958,582

HIGH-TEMPERATURE HEAT-INSULATING STRUCTURE

Fumiyoshi Noda, Toyota, and Yukihisa Takeuchi, Aichi, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Feb. 20, 1974, Ser. No. 443,985
Claims priority, application Japan, Feb. 26, 1973, 48-22923
Int. Cl. C04b *35/18*; F16l *59/14*
U.S. Cl. 138—149 **8 Claims**

1. A method of making a heat-insulating structure which comprises the steps of introducing into a casing an aqueous slurry having 60–80% solids content consisting essentially of monoaluminum phosphate, foamable perlite and ceramic fibers, with the monoaluminum phosphate constituting from about 20% to about 40% by weight of the slurry and the foamable perlite and ceramic fibers constituting a total of

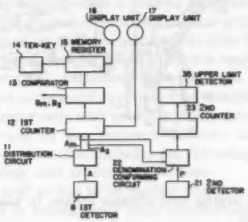
from about 30% to about 60% by weight of the slurry, and firing said slurry within the casing.

3,958,583

MONEY DISPENSER

Hideto Shigemori, and Motoaki Fukunaga, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Himeji, Japan

Filed Dec. 18, 1973, Ser. No. 425,825
Claims priority, application Japan, Dec. 23, 1972, 48-2261
Int. Cl.² G07D *1/00*
U.S. Cl. 133—4 R **4 Claims**



1. A money dispenser comprising a money container section for storing pieces of money to be dispensed, a money conveying section for conveying pieces of money stored in the money container section one by one to a money dispensing outlet, a money counting section for counting the value of money dispensed by detecting each piece of money conveyed by the money conveying section, a memory section for storing data on the value of money designated to be dispensed, and a comparison section for comparing the content stored in the money counting section and the content stored in the memory section to control a money dispensing operation of said money dispenser, and an upper limit detector coupled to said money counting section for producing an error detection signal when the value of the money counted by said money counting section exceeds an upper limit value set in advance, whereby an over-dispensation of money caused when the control operation for suspending money dispensing operation is effected abnormally is indicated by the error detection signal.

3,958,584

SYSTEM FOR FLUSHING OF A MILKING MACHINE

Leon Jones, 11332 Pemberton Road, Los Alamitos, Calif. 90720

Filed Apr. 10, 1975, Ser. No. 566,701
Int. Cl.² B08B *9/06*; F16K *31/143*
U.S. Cl. 134—56 R **21 Claims**

12. In a cow milking machine system including a teat cup and a flexible milk line connected to the teat cup and adapted to be connected to a milk collection line, the improvement comprising apparatus for flushing said flexible milk line and

said teat cups with a sanitizing solution, said apparatus comprising

a source of sanitizing solution

a sanitizing line connected to said sanitizing solution source, and

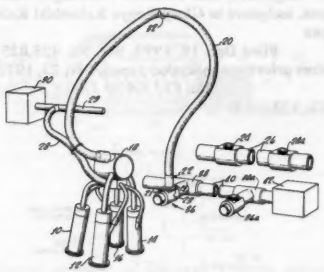
a flush valve connected to said sanitizing line, said flush valve comprising

milk line fitting means for connecting said valve to said flexible milk line,

a drain port,

valve closure means movably mounted for blocking communication between said milk line fitting means and said sanitizing line in a drain position, for unblocking communication between said milk line fitting means and said drain port in said drain position, for unblocking communication between said sanitizing line and said milk line fitting means in a flush position and for blocking communication between said milk line fitting means and said drain port in said flush position,

means for moving said closure means to said flush position,



means for urging said closure means to said drain position, and

means for retarding motion of said closure means from said flush position to said drain position.

17. A self-cycling valve comprising

a body having an input port and an output port in fluid communication with each other and a drain port in communication with one of said input and output ports,

closure means movably mounted within the body for blocking communication between said input and output ports and unblocking communication with said drain port in a drain position, and for unblocking communication between said input and output ports and blocking communication with said drain port in a flow position,

means for moving said closure means to said flow position,

means for urging said closure means toward said drain position, and

means for retarding motion of said closure means from said flow to said drain position.

3,958,585

APPARATUS FOR STRIPPING RESIDUAL SOLVENT FROM POLYMER PELLETS

Robert Garnett Humkey, Wilmington, Del., and Donald James Ryan, Port Neches, Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 433,378, Jan. 14, 1974, Pat. No. 3,920,624. This application May 16, 1975, Ser. No. 578,138

Int. Cl.² B08B *3/04*

U.S. Cl. 134—61 **2 Claims**

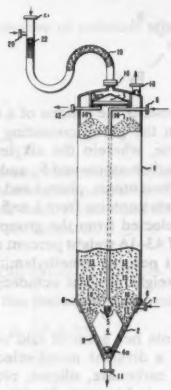
1. An apparatus suitable for removing residual volatiles from solid pellets which consists essentially of the combination of:

a. a vertical cylindrical top section having a length-to-diameter ratio greater than about 3:1 above,

b. an inverted conical bottom reducing section,

c. a first conical pellet distributor axially centered with its apex just below and adjacent to a pellet inlet at the center of the top of the column, the circular horizontal base of said distributor having a diameter of about one-half the diameter of the cylindrical column,

d. a second pellet distributor located within the conical bottom reducing section, said second pellet distributor having the form of two cones joined at their bases, said cones haing included angles approximately equal to the included angle of the conical reducing section at the bottom of the column and said second distributor being axially centered with its upper apex at the level of the knuckle joining the cylindrical top portion and the conical bottom reducing section of the column leaving an annular passage between the distributor the wall of the



conical reducing section, said second pellet distributor containing circumferentially distributed means in its top portion for passing gas from the interior to the exterior,

e. gas inlet means leading to the interior of the second pellet distributor,

f. gas inlet means circumferentially evenly spaced near and around the top of the inverted conical reducing section of the column,

g. a pellet outlet at the base apex of the inverted conical reducing section of the column said first conical pellet distributor (c) is hollow and affords means in its conical surface to permit liquid to flow through from the exterior to the interior of the hollow distributor, and means leading from the interior of said first distributor to a liquid outlet outside the column and in which the pellet inlet at the center of the top of the column is connected to a liquid S- seal having a mixing tee at its further end with an inlet for liquid and an inlet for solid pellets, and

h. a gas outlet in the top of the column.

3,958,586

COMBINED WASHER AND DRYER UNIT

Charles Wayne Schnelle, Aurora, Mo., assignor to Tasope' Limited, Aurora, Mo.

Filed Dec. 4, 1974, Ser. No. 529,404

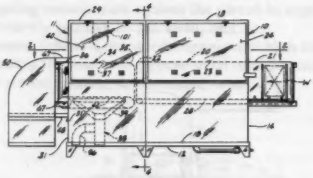
Int. Cl.² B08B *3/02*

U.S. Cl. 134—68 **4 Claims**

1. In a combination washer and dryer unit for printing plate workpieces:

a. a first housing having opposed ends each including an opening,

b. a second housing, having opposed ends each including an opening, said second housing being disposed in adjacent end-to-end relation with said first housing,
c. a first belt conveyor assembly mounted to said first housing and including a continuous movable belt extending outwardly of one of the openings of said first housing and through the opening of the adjacent end of said second housing and into the interior of the second housing,
d. a second belt conveyor assembly mounted to said second housing and including a continuous, movable belt terminating inwardly of said opening of said adjacent end of said second housing,



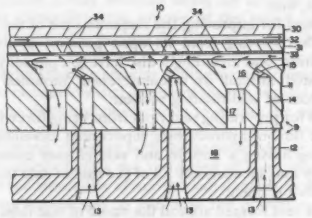
e. spray means mounted within one of said housings for washing a workpiece on the conveyor belt thereof,
f. drying means mounted within the other of said housings for drying a workpiece on the conveyor belt thereof, and
g. drive means for driving the conveyor belts in the same direction, said conveyor belts being substantially longitudinally aligned in the same plane and sufficiently close so that the workpiece can be transferred from one belt to the other after passing into the second housing.

3,958,587

MANIFOLD FOR FLUID DISTRIBUTION AND REMOVAL

Silas A. Brown, Lake Elmo, Minn., assignor to Buckbee-Mears Company, St. Paul, Minn.

Filed Dec. 19, 1974, Ser. No. 534,212
Int. Cl.² B08B *3/02*
U.S. Cl. 138—198 **7 Claims**



1. An apparatus for the uniform distribution of fluid to the surface of an article comprising:

a fluid distributing member having a plurality of fluid sources located therein for supplying fluid to the surface of an article, each of said plurality of sources having a plurality of fluid inlets for directing fluid at an acute angle with respect to the surface of the article so that the momentum of the incoming fluid is substantially tangential to the surface of the article;

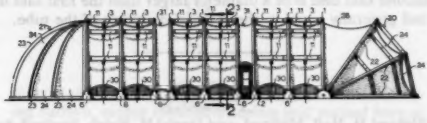
a back member located in spaced relationship from said fluid distributing member, said back member and said fluid distributing member defining a chamber where said back member and said fluid distributing member are uniformly spaced from one another, to thereby allow an article to be inserted in said chamber; said plurality of sources located in spaced relationship to one another to thereby distribute the fluid to the surface of the article which is held in a spaced relationship from said plurality of sources by the fluid supplied from said plurality of sources, a plurality of sinks located in said member, said plurality of sinks located in spaced relationship to one another and in fluid communication with said fluid inlets to thereby remove fluid which is supplied to the surface of the article.

3,958,588

ERECTION METHOD FOR VAULTED PAVILION

Carl Fred Huddle, Pleasant Ridge, Mich., assignor to Tension Structures Co., Pleasant Ridge, Mich.

Division of Ser. No. 255,899, Feb. 14, 1972, Pat. No. 3,820,553, which is a continuation-in-part of Ser. No. 93,293, Nov. 27, 1970, abandoned. This application June 21, 1974, Ser. No. 469,814
Int. Cl.² E04B *1/347*; A45F *1/16*
U.S. Cl. 135—4 R **8 Claims**



1. In the construction of a vaulted membrane shelter comprised of at least two substantially vertical arches with curved bights mounted on the ground or other base face to face but spaced apart and fixed in space to form a vaulted framework; a roof membrane, extending between, and operatively attached to said arches and said base that is tensioned longitudinally and transversely with an inward concave curvature of at least 5 percent of the distance between said arches; the method of erection that includes the following steps:

a. assembling said arches on said base
b. raising said arches to an upright position and fixing them in space in substantially their erected positions
c. installing said roof membrane by operatively attaching it to said arches in sections or as a whole
d. pulling and sliding said roof membrane along said arches downward toward said base
e. tensioning said membrane downward between said arches and securing it:
   1. directly to said base;
   2. indirectly to said base by at least one tension ring with its ends attached to:
      a. said base;
      b. the lower portion of said adjacent arches.

3,958,589

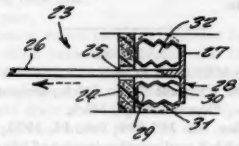
SIPHON

John J. Geist, and Joseph Giba, both of c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed July 16, 1974, Ser. No. 488,913
Int. Cl.² F04F *10/00*
U.S. Cl. 137—149 **1 Claim**

1. A siphon comprising a flexible tube of generally uniform diameter having an open inlet and an open outlet end in combination with a generally cylindrical resilient piston mounted snugly within said tube, said piston being axially compressible and radially expandable wherein axial compression causes radial expansion, including a cord mounted through the axial center of the piston attached to a disc bearing against the end of the piston facing the tube inlet, said disc being of smaller diameter than said piston and formed of material relatively rigid compared to the piston whereby axial pressure of said disc against said piston causes radial expansion to sealingly conform to the tube internal surface, further including a lat-

eral outlet nipple provided adjacent but spaced from the outlet end, wherein said piston is smaller in length than the tube length between the nipple and the outlet end and there is provided a second relatively rigid disc abutting the piston on



the end facing the outlet end of the tube, wherein the piston is formed of an air filled accordian diaphragm and wherein the second said disc is of a diameter larger than the first said disc and generally equal to the internal diameter of the tube.

3,958,590

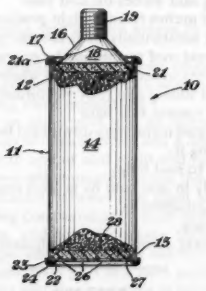
PACKAGE

Richard H. Hall, Midland, and Daniel H. Haigh, Sanford, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 12, 1974, Ser. No. 532,129

Int. Cl.² B01D *13/00*

U.S. Cl. 137—172 **9 Claims**



1. In a package, the package comprising a container, the container having a tubular body, the container body having a first end and a second end and a passageway extending therebetween, the container body defining a first body opening and a second body opening in full communication with the passageway, a first closure member affixed to the first end of the container body, a body of flexible synthetic resinous open cell foam disposed at the first end of the body and being generally coextensive with the first opening, a peripheral portion of the flexible synthetic resinous open cell foam being disposed between the first end of the body and the first closure and compressed between the closure and the body to form a liquid tight seal.

3,958,591

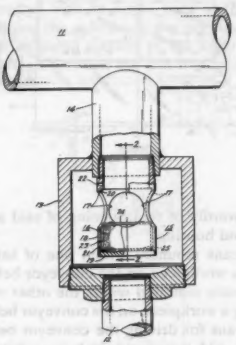
QUICK RESPONSE FLOAT VALVE FOR USE IN VAPOR RETURN LINES

William B. Hansel, Media, and Walter D. Wagner, Chaddsford, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 538,053, Jan. 2, 1975, Continuation-in-part of Ser. No. 538,057, Jan. 2, 1975. This application Apr. 28, 1975, Ser. No. 572,028

Int. Cl.² F16K *31/22*

U.S. Cl. 137—202 **4 Claims**



1. A float valve, for use in an environment having hydrocarbon fluid in both a liquid and a vapor state, at a location which experiences hydrocarbon liquid flow and high velocity vapor flow, said float valve designed to close when liquid enters the valve and to remain open at all other times including periods of high velocity vapor flow, and comprising:

a. a float comprising:

i. a floating section having a flat upper surface and a flat lower surface,

ii. a solid disc mounted on the upper surface of the float and having a smooth and regularly shaped circumference, and

iii. means for improving the response time of the floating section moving from its open position to its closed position, and including a disc having a plurality of slots located around its circumference, mounted on the bottom of said floating section;

b. means for preventing said float from being forced upward by the flow of hydrocarbon vapors, and including a float housing having a bottom and side closure covering the bottom and substantially all of the side of said float when the valve is open;

c. a valve seat formed around the inside of said float housing and directly above the top of said float; and

d. means defining apertures spaced around said float housing between the valve seat and the top of said float.

3,958,592

SAFETY SHUT-OFF VALVE

Richard E. Wells, Westminster; Victor E. Derval, Seal Beach, and John D. Muchow, Cerritos, all of Calif., assignors to Willis Oil Tool Co., Long Beach, Calif.

Filed Feb. 6, 1974, Ser. No. 440,125

Int. Cl.² F01B *31/00*; F16K *31/122, 41/04, 41/14*

U.S. Cl. 137—315 **5 Claims**

1. In a valve for controlling pressurized fluid wherein: a valve body has a passage therethrough for the pressurized fluid; a valve gate on a valve stem is movable axially to move the valve gate to open and closed positions; a control chamber

has a cylindrical wall and an outer end wall secured to a rim end face of the cylindrical wall; a piston in said chamber is connected to said stem for inward movement to drive the valve gate inward to one of its positions in response to fluid pressure in the control chamber; spring means in the control chamber urges the piston outwardly; and said piston has an outer circumferential groove to seat resiliently compressible annular sealing means,

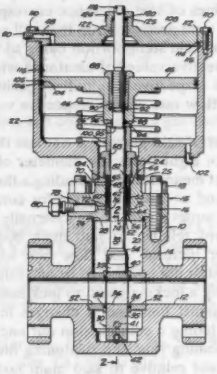
the improvement to facilitate installation and replacement of said annular sealing means, in which:

the outer end wall of said chamber is removable for access to the piston;

said piston is slidably mounted on said stem;

said spring means seats against the piston to urge the piston outwardly relative to the stem; and

nut means in screw threaded engagement with the stem and abutting the piston to oppose axial outward movement of the piston relative to the stem,



whereby, with said end wall removed, said nut means may be rotatably moved to a threadedly connected loosened position on the stem to permit the spring means to shift the piston axially outward along the stem to expose the outer circumferential groove of the piston outside the control chamber beyond the rim end face of the cylindrical wall for installation of said annular sealing means and whereby after the annular sealing means is installed in the outer circumferential groove of the piston, said nut means may be tightened on the stem to retract the piston along the stem past the rim end face of the cylindrical wall into the control chamber with the annular sealing means initially visible during the retraction of the piston to minimize the possibility of unobserved damage to the annular sealing means and to minimize the possibility of unobserved inclination of the annular sealing means out of its normal plane during the retraction of the piston.

3,958,593

APPARATUS FOR CONNECTING A MAIN TO A PLURALITY OF SIZES OF SERVICE LINES

Joe William Christie, Box 386, Frisco, Tex. 75034

Continuation-in-part of Ser. No. 469,529, May 13, 1974. This application Sept. 26, 1974, Ser. No. 509,719

The portion of the term of this patent subsequent to Feb. 10, 1993, has been disclaimed.

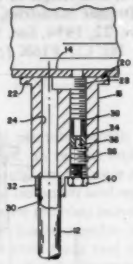
Int. Cl.² B23B *41/08;* F16E *41/04*

U.S. Cl. 137—318 **7 Claims**

1. An apparatus for selectively connecting a plurality of sizes of service lines at a right angle to a cylindrical main, comprising:

a fitting having a concave cylindrical mounting surface formed on one end thereof, first and second parallel spaced through bores extending from said mounting surface through the length of said fitting to the opposite end thereof, said first and second bores having their centers extending at right angles to the center line of said concave cylindrical surface;

a port in said fitting interconnecting said first and second bores for fluid communication therebetween, means in said second bore for forming a port in the wall of said



main at said end of said second bore adjacent said mounting surface, means releasably sealing said second bore at the end opposite said mounting surface, and said first bore being of a diameter to contact and fuse around the exterior of the first size service line, an annular portion extending from said fitting concentric with said first bore and defining an internal cylindrical surface concentric with said bore at the end away from said mounting surface, said cylindrical surface being of a size for contacting and fusion around the exterior of a second size of service line.

3,958,594

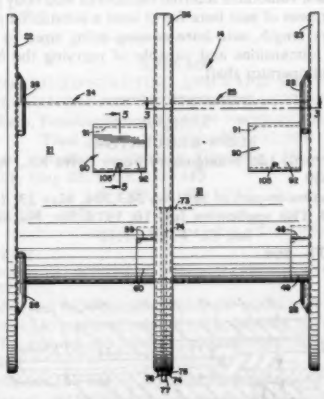
DUAL HOSE REEL

Philip C. Masters, Ashland, Ohio, assignor to McNeil Corporation, Akron, Ohio

Filed July 11, 1974, Ser. No. 487,753

Int. Cl.² B65H *75/34*

U.S. Cl. 137—355.17 **11 Claims**



1. A hose reel assembly for use with a sewer cleaning machine comprising a drum member, side plates at each end of said drum member, divider plate means between said side plates cooperating with said side plates to separate said drum

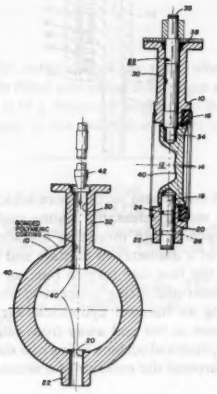
member into two hose confining areas, separate hoses normally coiled on said drum member within each hose confining area, liquid input means along the axis of said drum member presenting a single source of liquid under pressure internally of said drum member, and control means receiving the liquid under pressure from said liquid input means and selectively diverting the single source of liquid to either of said hoses.

3,958,595

CORROSION RESISTANT VALVE CONSTRUCTION

Rene J. Al, Bradford, and Ralph E. Henry, Rixford, both of Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 22, 1974, Ser. No. 526,209
Int. Cl.² F16K 1/22
U.S. Cl. 137—375 **11 Claims**



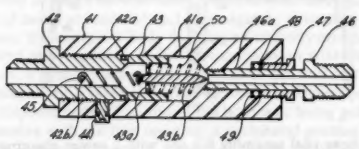
1. In a butterfly valve for corrosive service including a metal body defining a flow passage between an inlet and an outlet, a trunnion mounted closure member in said passage operable between open and closed positions thereof, an operator shaft extending from a driving connection with said closure member to a location external of said body, and means defining at least one bore through a wall of said body for accommodating said operator shaft, a corrosion resistant coating bonded to at least the corrosion vulnerable internal surfaces of said body including the surfaces of said bore for at least a substantial portion of the bore length, said bore coating being sized to within controlled dimensions and capable of carrying the bearing load of said operator shaft.

3,958,596

FLOW REGULATOR

Bruce Garrard, 126 Montgomery Ferry Drive NE., Atlanta, Ga. 30309

Continuation-in-part of Ser. No. 363,304, May 23, 1973, abandoned. This application July 10, 1974, Ser. No. 487,015
Int. Cl.² F16K 31/12
U.S. Cl. 137—504 **1 Claim**



1. A fluid flow regulator comprising a main body having a central bore, a plunger operable in said bore, spring means having a chosen load per deflection characteristic and biasing said plunger away from said outlet means, said outlet means including an outlet hole, said plunger including a tapered stem portion extended toward and axially aligned with said outlet hole, there being clearance between the outer end of said tapered stem portion and said outlet hole, said clearance being controlled by the tapered shape and longitudinal position of said tapered stem portion relative to said outlet hole, said plunger including an orifice to permit flow therethrough, a given flow rate through said regulator being correlated with a resultant pressure drop across said plunger orifice and with a specific first force due to said resultant pressure drop tending to move said plunger toward said outlet hole, said plunger being further acted on by a second force in the same said direction due to total pressure drop across the regulator acting on said stem portion, said stem portion having a respective longitudinal position relative to said outlet hole for said given flow rate for each respective value of total pressure drop, due to the combined action of said first and second forces to deflect said spring means a specific amount for each combination of given flow rate and total pressure drop, there being respective values of said clearance corresponding to respective values of total pressure drop that will control said flow to said given rate, said stem portion being so tapered as to provide said respective values of clearance when said stem portion is in each respective longitudinal position corresponding to said given flow rate and to respective values of total pressure drop,

the diameter of said plunger is not less than four times nor more than eight times the diameter of said outlet hole, said outlet means further including a threaded outlet stem portion and an external fitting for connection to a fluid line, said outlet means being externally adjustable inward or outward relative to said main body to respectively reduce or increase said flow rate while said fitting is connected or not connected to said fluid line, and further comprising a locking gland to lock said adjustable outlet means against unintended changes in adjustment, said gland including a compression nut and a rubber, or rubberlike, sealing ring, the tightening inward of said compression nut relative to said main body deforming said sealing ring into high pressure contact with said outlet stem at the inner portion of said sealing ring and into high pressure contact with said main body at the periphery of said sealing ring, both of said contacts having high frictional force and thereby causing a locking bond between the outlet stem, sealing ring and main body.

3,958,597

THROTTLE CONTROL FOR REMOTE AIR DRIVEN DEVICES

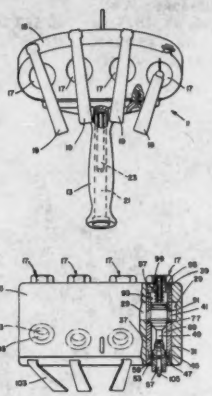
Robert W. Meyer, Belfair, and Richard I. Schrick, Bremerton, both of Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 21, 1974, Ser. No. 516,320
Int. Cl.² F16K 11/14
U.S. Cl. 137—546 **6 Claims**

1. A throttle control comprising:

a. a body;
b. at least one valve;
c. said at least one valve including a control valve and a vent valve;
d. means for sequentially opening said vent valve and then said control valve;
e. said body includes a handle;
f. said handle includes a chamber;
g. said vent valve having an outlet that is operably connected to said chamber and said chamber being operably connected to atmosphere;
h. a tube having one end connected to said outlet of said vent valve and the other end extending into said chamber in said handle;

i. an atmospheric outlet opening in said chamber positioned adjacent said one end of said tube; and



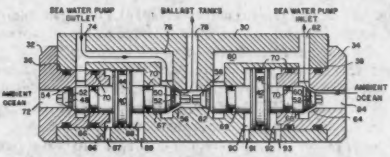
j. whereby liquid droplets contained in a gas discharged in said chamber will be separated from said gas and collected in said chamber.

3,958,598

HIGH PRESSURE, 4-POSITION, 5-WAY, PILOT OPERATED VALVE FOR CORROSIVE MEDIA

William E. Schneider, Annapolis, and John A. Sasse, Stevensville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 25, 1975, Ser. No. 561,964
Int. Cl.² B63G 8/22
U.S. Cl. 137—596.18 **6 Claims**



1. A high pressure, 4-position, 5-way, pilot pressure operated valve for operation in a high pressure environment comprising:

a valve body having a plurality of inlet and outlet ports for the flow of high pressure fluid;

a pair of poppet pistons contained in sliding and sealing relationship within bores in said valve body;

each of said poppet pistons having a pilot pressure actuated piston centrally located thereon, one having a larger diameter than the other to provide a larger control force;

a valve poppet located at each end of each respective poppet piston;

said poppet pistons being co-axial within said body to contact one another, so that the one larger poppet piston, at one position, contacts and controls said other poppet piston, to prevent it from moving fully and sealing either of its poppet valves; and

a pilot hydraulic fluid pressure cavity in said valve body on either side of each of said pilot pressure actuated pistons;

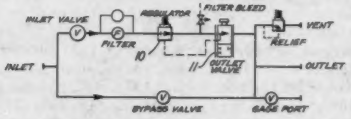
whereby each piston may be independently axially moved to provide 4-position, 5-way action in a high pressure pilot operated valve.

3,958,599

REMOTE SENSING REGULATOR AND SHUTOFF VALVE FOR VALVE MANIFOLDS

Robert S. Sheldon, and David E. Whitten, both of Northridge, Calif., assignors to Air-Dry Corporation, Northridge, Calif.

Filed Aug. 29, 1974, Ser. No. 501,785
Int. Cl.² F16K 11/10
U.S. Cl. 137—613 **5 Claims**



1. In a valve manifold assembly which includes a pressure regulator having an input, an output and a pressure sensing chamber, said assembly also including a shutoff valve having an inlet connected to the output of said regulator, said shutoff valve having a valve closure member movably mounted within a valve body, said valve closure member being movable to an open position to permit flow from said regulator outlet into and through said shutoff valve, the opening between said valve closure member and adjacent portions of said valve body forming a restricted area which causes turbulence so that the pressure within said restricted area is reduced to an amount less than the output pressure of said shutoff valve, said shutoff valve having a sensing pressure outlet, passage means in said shutoff valve connecting said restricted area to said sensing pressure outlet, and means connecting said sensing pressure outlet to said sensing chamber of said pressure regulator, so that the pressure sensed by said regulator is the reduced pressure of said restricted area, which is less than the outlet pressure of said shutoff valve, thereby causing an increase in the output pressure of said regulator above the amount which would normally be provided in response to sensing the output pressure of said shutoff valve, to provide pressure compensation over and above the amount required to compensate for pressure drops between said regulator and said shutoff valve and thereby provide additional pressure compensation for reference spring rate changes and for pressure drops downstream from said shutoff valve which are not reflected by the output pressure of said shutoff valve, whereby said pressure regulating means provides compensation for substantially all of the pressure losses both upstream and downstream from the shutoff valve.

3,958,600

COMBINED STARTING AND RAPID SHUT-OFF MECHANISM FOR STEAM AND GAS TURBINES

Hans Kalb, Frankenstrasse 81, 8500 Nurnberg, Germany

Filed Jan. 9, 1974, Ser. No. 432,099
Claims priority, application Germany, Jan. 25, 1973, 2303511; May 25, 1973, 2327443
Int. Cl.² F16K 17/10
U.S. Cl. 137—630 **1 Claim**

1. A combined starting and rapid shut-off valve for a turbine comprising:

a housing (1) defining an inlet port (16) and an outlet port (37),

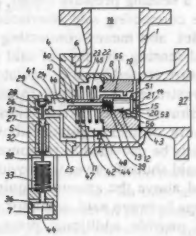
a valve seat (43) circumscribing the outlet port (37),

a flange (4) mounted relative to the housing (1) and having a flange bore (46) and a communicating flange chamber (24),

a cylinder (6) having a cylinder chamber (42) centrally thereof and being carried by the flange (4) and extending inwardly therefrom and within the housing (1),

a pressure medium controlled main valve (8) having a stepped main valve chamber (39) centrally thereof and said main valve being reciprocable within the cylinder chamber (42) toward and away from the valve seat (43),

a spring (11) seated within the cylinder chamber (42) for urging the main valve (8) toward the valve seat (43),
a spindle (10) having a through bore and carried by and projecting outwardly from the side of the main valve (8) remote from the valve seat (43) and being accommodated for radial play within the flange bore (46),
a secondary valve opening (21) within the main valve (8),
a main valve chamber spring (13) seated within the main valve chamber (39),
the flange chamber (24) being in fluid communication with the main valve chamber (39) via the through bore of the spindle (10),
a stepped secondary valve member (12) slidable in the stepped main valve chamber (39) and being biased by the main valve chamber spring (13) toward a closed position with respect to the secondary valve opening (21),
the secondary valve opening (21) communicating with a piston chamber (51) in the main valve (8) and radial bores (19) through the main valve (8) when stepped secondary valve member (12) is opened and communicating only with outlet connection (37) when stepped secondary valve member (12) is closed,
a pilot valve (5) mounted adjacent the flange (4) and having a pilot valve chamber with a passage to atmosphere (29),



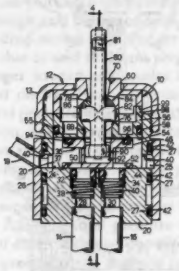
an inlet port passage (26) communicating between the pilot valve chamber and the inlet port (16),
a double-acting pilot valve (28) movable within the pilot valve chamber between a first positon of blocking the passage to atmosphere (29) and a second position of closing off the inlet port passage (26),
a radial central side connection (41) via the flange chamber (24) between the pilot valve chamber and the flange bore (46) wherein with the double-acting pilot valve (28) being in a first position a passage (25) leading from the interior of the housing (1) is connected to the flange bore (46) and being in a second position the flange bore (46) is vented to atmosphere,
a groove (47) in the outer surface of the spindle (10) for establishing a fluid connection between the flange chamber (24) and the cylinder chamber (42) in the main valve fully-opened condition,
and a valved throttling connection (48, 44) between the inlet port (16) and the cylinder chamber (42) with the cylinder chamber (42) providing a cushion against too-rapid movement of the main valve (8) and with the degree of cushioning being determined by the play between the spindle (10) and the flange bore (46) and with the valved throttling connection regulating the flow of fluid to and from the cylinder chamber (42).

3,958,601

SINGLE LEVER FAUCET VALVE CARTRIDGE

William C. Schmitt, Brown Deer, Wis., assignor to Milwaukee Faucets, Inc., Milwaukee, Wis.

Filed July 18, 1975, Ser. No. 597,206
Int. Cl.² F16K *11/02*
U.S. Cl. 137—636.2 **8 Claims**



1. A single lever faucet valve cartridge for use with a faucet valve having a chamber for receiving the faucet valve cartridge and including fluid pressure inlets, said faucet valve cartridge comprising:
a valve disc received in slideable fluid tight relationship over said inlets for variably blocking said inlets and including spaced bores for alignment with said inlets to permit fluid flow therethrough,
a generally cylindrical cartridge body having a transverse generally flat wall for receiving said valve disc thereagainst in sliding relation,
a sealing member engageable with an end of said body opposite said flat wall, said cartridge body and said sealing member defining a cylindrical chamber therebetween,
a generally cylindrical barrel including a slot therethrough, and rotatably receivable in said cylindrical chamber such that the axis of said cylindrical barrel is parallel to said flat wall,
and a lever pivotably received in and extending through said slot and journaled therein for universal joint movement with respect to said body and sealing member,
said sealing member further including a bore extending therethrough, through which one end of said lever extends, and said lever being operably connected to said valve disc whereby movement of said one end of said lever causes sliding movement of said valve disc parallel to said flat wall and with respect to said inlets to permit variable alignment of said spaced bores with said inlets.

3,958,602

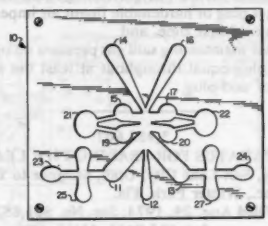
FLUERIC LAMINAR DIGITAL AMPLIFIER

Francis M. Manion, Rockville, and Tadeusz M. Drzewiecki, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 12, 1975, Ser. No. 557,705
Int. Cl.² F15C *1/10, 1/18*
U.S. Cl. 137—836 **4 Claims**

1. A flueric laminar bistable amplifier comprising: a supply nozzle means for providing a laminar fluid jet stream; a pair of outlet channel means for receiving the laminar fluid jet from said supply nozzle means; an interaction region disposed between said supply nozzle means and said outlet channel means in which region the deflection of said laminar fluid jet stream into a respective one of said outlet channel means is effected; a pair of control channels communicating with said interaction region and disposed ajacent said supply nozzle means on opposite sides thereof; a pair of vent channels communicating with said interaction region and disposed down

stream of said control channels to opposite sides of the laminar fluid jet from said supply nozzle means; supply means connected to said vent channels for supplying fluid pressure to said vent channels to cause a fluid flow therefrom in excess of that required for entrainment by the fluid jet stream; means



coupled to each control channel means for venting same to ambient and providing an exhaust path for the excess fluid flow from said vent channels over and above the flow required for entrainment; and means for providing back pressure within said control channel means to impinge upon and control the out flow of said excess fluid through said exhaust path.

3,958,603

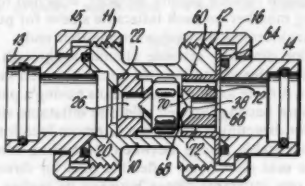
INSERT FOR MOVABLE DIAPHRAGM TYPE FLOW CONTROL VALVE

John Bannon, Rowayton, Conn.; Steve Goldman, Monsey, N.Y., and Richard A. Lametto, Norwalk, Conn., assignors to The Nash Engineering Company, Norwalk, Conn.

Continuation of Ser. No. 359,811, May 14, 1973, abandoned. This application Dec. 9, 1974, Ser. No. 530,568

Int. Cl.² F16K *15/02*

U.S. Cl. 138—43 **4 Claims**



1. A flow control valve comprising a housing, a flow path through the housing, a fixed seat disposed in the flow path and defining a central flow aperture, a flexible diaphragm element disposed in the housing and upstream of the seat relatively to normal flow through the valve, said diaphragm being deformable to modify flow through said flow aperture, retention means secured upstream of said diaphragm element and constituting means preventing the movement of said diaphragm element therepast upon the occurrence of a back flow through the valve, said retention means comprising a central flow passage and a plurality of flow passages disposed radially outwardly of said central flow passage, the plurality of flow passages constituting means for straightening flow to reduce turbulence while allowing substantially unimpeded normal flow through the valve.

3,958,604

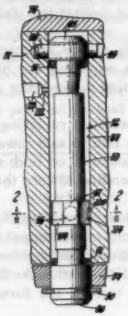
CONTROL VALVE

Donald D. Stoltman, Henrietta, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 291,213, Sept. 22, 1972, Pat. No. 3,814,537. This application Jan. 14, 1974, Ser. No. 433,009

Int. Cl.² F16K *47/00*

U.S. Cl. 138—46 **4 Claims**



1. A control valve comprising a cylinder; a valve pin disposed in the cylinder; means defining a fulcrum on the valve pin transverse to the cylinder; the valve pin having a zone spaced lengthwise of the pin from the fulcrum having a small clearance from the cylinder; the cylinder defining opposed fluid inlet and outlet ports aligned with said zone disposed so as to be restrictable reversely by rotation of the valve pin about the fulcrum; means within the valve pin for defining a restricted passage threrethrough aligned with one of said ports; means defining a passage communicating with the said restricted passage and leading through said clearance and the other of said ports and also to a pressure connection extending exteriorly of the cylinder so that the pressure in the pressure connection is a function of rotation of the valve pin about the said fulcrum; and means for rotating the valve pin about the said fulcrum.

3,958,605

AUTOMATIC CONTROLLING DEVICE FOR MAINTAINING A CONSTANT RATE OF AIR FLOW IN AIR-CONDITIONING EQUIPMENT

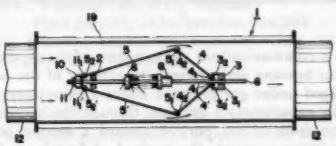
Eisuke Nishizu; Michitomo Okubo, and Eiichi Wada, all of Neyagawa, Japan, assignors to Sinko Kogyo Co., Ltd., Osaka, Japan

Filed Nov. 25, 1974, Ser. No. 527,147

Claims priority, application Japan, Apr. 23, 1974, 49-46208

Int. Cl.² G05D *7/00*

U.S. Cl. 138—46 **1 Claim**



1. An automatic controlling apparatus for maintaining constant air flow through an air-conditioning duct, said apparatus comprising:

an open-ended casing fitted into said air conditioning duct in the direction of the air flowing in said duct, whereby the air flowing through said duct flows through said casing;

two bearing beams fitted crosswise in said casing, the first beam at the forward upstream portion of the casing and the second beam at the rearward downstream portion of the casing, both of said beams having a hole through the center thereof, said holes aligned with each other in the center of said casing;

a shaft slidably fitted through said holes in said bearing beams;

spring means concentrically surrounding and attached at one end to said shaft at substantially the central portion thereof for biasing against the sliding movement of said shaft;

adjustable regulating means adjacent and contacting said spring means for adjusting the biasing strength of the spring means acting against the sliding motion of the slidable shaft;

upper and lower pressure receiving plates hingedly connected along one end to said reward bearing beam, and symmetrically positioned on both sides of said shaft with the free ends extending toward the forward direction of said casing;

upper and lower guide plates hingedly connected along one end to the free ends of said upper lower pressure-receiving plates respectively and symmetrically positioned on both sides of said shaft with the free ends of said guide plates extending toward the forward direction of said casing; and

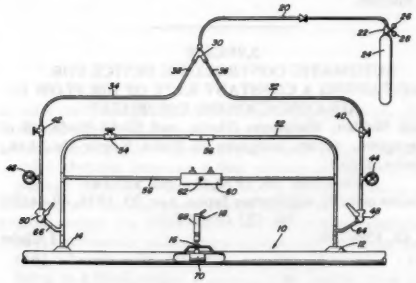
fastening means adjustably fixed to the forward edge of said slidable shaft and hingedly connected to the free ends of said upper and lower guide plates for fastening the guide plates to said slidable shaft.

3,958,606

METHOD AND APPARATUS FOR ELIMINATING AIR FLOW IN COMMUNICATIONS CABLES TO ASSIST IN PLUG FORMATION

Javier R. Viramontes, Star Rte., Box 18, Mesilla Park, N. Mex. 88047

Filed May 17, 1974, Ser. No. 471,131
Int. Cl.² F16L *57/00*
U.S. Cl. 138—97 **4 Claims**



1. In a communications cable system of the type including a tubular housing and wherein the interior of the housing is maintained under gas pressure above ambient pressure and normally experiences a gas flow through the housing in one direction from a first portion toward a second portion of slightly lower pressure; the method of forming a fluid and gas-tight plug in a first zone of the interior of said housing spaced intermediate said first and second portions by the injection of a plug of fluent gas impervious hardenable material in said first zone, said plug being subject to gas trails being forced therethrough prior to at least initial hardening of said material in the absence of substantially equal gas pressure within said housing on opposite sides of said plug, said method comprising:

a. establishing a closed external gas flow line communicated at its opposite ends with second and third zones of the interior of said housing intermediate said first and second pressurized portions and on opposite sides of said first zone,

b. introducing gas into at least the end portion of said external flow line which opens into said housing downstream from said first zone and at a rate and pressure sufficient to terminate the flow of gas through said first zone,

c. pouring a plug of hardenable fluent air impervious material into said first zone, and

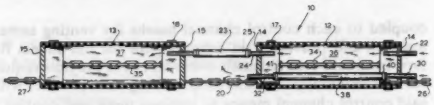
d. thereafter maintaining said gas pressure on opposite sides of said plug equal throughout at least the initial curing period of said plug.

3,958,607

APPARATUS FOR SEALING PIPE LEAKS

Sam L. Gray, Salt Lake City, Utah, assignor to The Penetryn System, Inc., Winter Park, Fla.

Filed Aug. 29, 1974, Ser. No. 501,853
Int. Cl.² F16L *55/18*
U.S. Cl. 138—97 **4 Claims**



1. A pipe leak sealing apparatus for the internal sealing of pipes comprising:

a pair of spaced inflatable sleeves;

a plurality of sealing members, one pair of said sealing members being located to seal each end of each inflatable sleeve;

a flexible spacing member connected between each pair of sealing members on the ends of each inflatable sleeve and being located inside each said sleeve;

flexible connecting means flexibly connecting one sealing member on one said inflatable sleeve with one sealing member on the other inflatable sleeve thereby spacing said inflatable sleeves in accordance with the length of said flexible connecting means;

an elongated flexible pulling member, attached to one said sealing member on each inflatable sleeve for pulling said pipe leak sealing apparatus from either end;

means for directing settable chemicals through said one inflatable sleeve and into the space between said sleeves from a remote location, said means having a pair of flexible pipes passing through said one inflatable sleeve; and

means for directing a fluid from a remote location into one said inflatable sleeve between its sealing members to inflate said sleeve and a flexible pipe for directing fluid from one inflatable sleeve between its sealing members into the other inflatable sleeve between its sealing members to inflate both inflatable sleeves whereby space in a pipe can be isolated between said inflatable sleeves when inflated and a leak sealed by the application of settable chemicals to said isolated space.

3,958,608

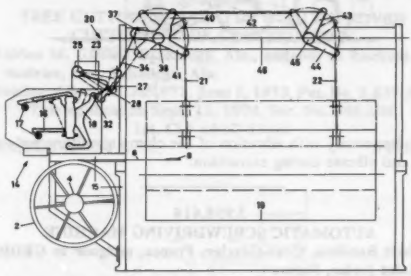
SHEDDING DRIVE ARRANGEMENT

Willy Rohr, Hinwil, Switzerland, assignor to Ruti Machinery Works Ltd., Ruti (Zurich), Switzerland

Filed Mar. 26, 1974, Ser. No. 454,965
Claims priority, application Switzerland, Mar. 30, 1973, 4583/73
Int. Cl.² D03D *13/00, 1/00*
U.S. Cl. 139—84 **5 Claims**

1. A shedding drive arrangement having a dobby driving the upper and lower sheds symmetrically and with a coupling arrangement, coupling jack levers of the dobby with the heald

frames, the coupling arrangement comprising first and second arms, each jack lever having a first arm and a second arm operatively connected with it, the second arm being pivotably mounted at one end about a stationary pivot and at its other end secured by means of a second pivot in pivotable manner to one end of the first arm, the other end of said first arm being pivoted to and driven by means of said associated jack lever, said jack lever, when in motion, producing a reciprocating movement which is carried out over a predetermined distance,



said movement producing at the first arm a force directed in the longitudinal direction of the said first arm and by which there is brought about a movement of the said end of the first arm that is connected to said second arm, which is unsymmetrical in relation to that position of the said one end of the first arm in which the plane defined by the axis of the second pivot and by the longitudinal direction of the first arm is in a tangential situation at the locus of the axis of the second pivot relative to the said stationary pivot.

3,958,609

DEVICES FOR INSERTION OF FILLING YARN IN A LOOM BY MEANS OF A FLUID

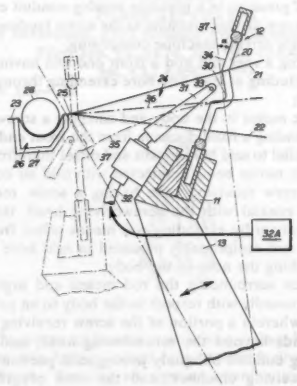
Hans Zollinger, Tann-Ruti, and Rolf Honegger, Durnten, both of Switzerland, assignors to Maschinenfabrik Ruti AG, Ruti (Zurich), Switzerland

Filed June 20, 1974, Ser. No. 481,252

Claims priority, application Switzerland, June 25, 1973, 9231/73

Int. Cl.² D03D *47/28*

U.S. Cl. 139—435 **8 Claims**



1. A loom having a device for the inserting of filling yarns by means of a fluid and having a reed for beating-up of the filling yarns, each of the teeth of the reed having a bulge the opening of which faces the filling yarn beating-up point, said bulges together forming a guide channel for the fluid serving for the insertion of the filling yarn, in which the bulge of each reed tooth is adjoined smoothly by at least one approximately linearly extending portion of the tooth to present a ridgeless smooth surface on the reed tooth, and the reed is so guided in its backward and forward movements that the bulges of the reed teeth lie within the shed in the position of the reed in which the insertion of the filling yarn takes place, and the linearly extending portion of each reed tooth is at the beating-up point when the reed is in the filling-yarn beating-up position, said bulge moving along an arcuate path and out of the shed so that a weft thread insertion can ride smoothly out of the bulge of each reed tooth on the said ridgeless smooth surface to its beat-up position on said approximately linearly extending portion.

3,958,610

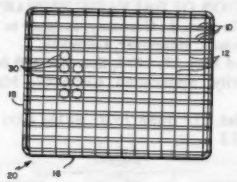
INNERSPRING

Harry A. Garceau, Charlton, Mass., assignor to Webster Spring Co. Inc., Oxford, Mass.

Filed Feb. 24, 1975, Ser. No. 552,641

Int. Cl.² B21F *27/16*

U.S. Cl. 140—3 CA **7 Claims**



1. The method of making a grid to which coil springs are adapted to be attached for the manufacture of spring assemblies, wherein a plurality of wires are arranged in spaced parallel crossing relation to each other with the wires running in one direction crossing one side of the wires running in the other direction, comprising forming depressions in the portions of the wires running in one direction situated between the portions of the wires running in the other direction downwardly from the plane of the grid by an amount such that the collective depressions reduce the overall length of the wires running in the one direction to a predetermined length corresponding to the desired length of the grid to be made.

3,958,611

APPARATUS FOR WINDING WIRE COILS FOR ELECTRICAL MACHINES

Karl Lesch, and Gerhard Brademann, both of Oldenburg, Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed July 15, 1975, Ser. No. 596,202

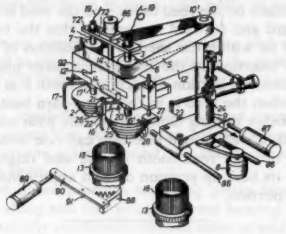
Claims priority, application Germany, July 18, 1974, 2434480; July 18, 1974, 244363

Int. Cl.² B21F *3/00*

U.S. Cl. 140—92.1 **27 Claims**

1. In an apparatus for producing coils for electrical machines, said apparatus including a support, a coil winding body in the form of a slide core mounted on said support, a flyer for winding the wire for the coil on said slide core, means for mounting said flyer on said support for relative rotation about said slide core, and a coil holder engaging one end of said slide core during the winding process, whereby the wire windings are formed on said slide core by the rotation of said flyer about said slide core and the major portion of the wire windings is pushed, during the winding process, onto said coil holder; the improvement comprising: a plurality of said slide

cores mounted adjacent one another on said support and simultaneously engaging the same said coil holder during the winding process; a plurality of said flyers, each mounted on said support for rotation about a respective one of said slide



cores; and means for simultaneously rotating said flyers in synchronism with one another about the respective said slide cores whereby a plurality of the coils for a complete winding may be simultaneously wound.

3,958,612

PRODUCTION OF GALVANIC PRIMARY CELLS

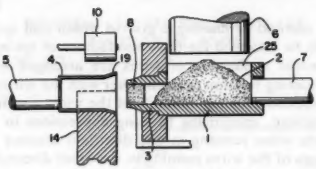
Alois Fränzl, Ellwagen, J., Germany, assignor to Varta Batterie Aktiengesellschaft, Hannover, Germany

Filed May 17, 1974, Ser. No. 470,863

Claims priority, application Germany, May 24, 1973, 2326460

Int. Cl.² B65B *1/04*; H01M *6/00*

U.S. Cl. 141—12 **19 Claims**



1. In the method of producing galvanic cells which includes pressing a predetermined quantity of depolarizer mass through a nozzle into each of a plurality of cell cups adapted to be serially brought into mating engagement with the nozzle, the improvement which comprises:

positioning in the nozzle a first discrete dose of the depolarizer mass which is less than the predetermined quantity,

introducing into the nozzle a second discrete dose of the depolarizer mass, and

pressing both doses through the nozzle toward a first cell cup in mating engagement with the nozzle.

3,958,613

TREE AND STUMP EXTRACTION

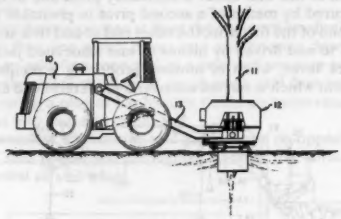
Alvin E. Herz, Nutley, N.J., assignor to L. B. Foster Company, Pittsburgh, Pa.

Filed Sept. 9, 1974, Ser. No. 504,090

Int. Cl.² A01G *23/06*

U.S. Cl. 144—2 N **8 Claims**

4. An apparatus for removing trees and stumps together with at least a portion of the root system comprising a mobile power source, clamp means extending from said power source and adapted to engage the trunk of a tree or stump to be removed, vibratory means directly attached only to said clamp to vibrate said tree or stump while in said clamp and lift means on the power source acting on said clamp lifting the clamp



simultaneously with vibration of the clamp simultaneously to lift and vibrate during extraction.

3,958,614

AUTOMATIC SCREWDRIVING MACHINE

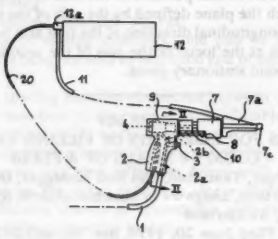
Robert Bandera, Cran-Gevrier, France, assignor to GEDIC, Saint Jorioz, France

Filed Apr. 11, 1975, Ser. No. 567,333

Claims priority, application France, May 17, 1974, 74.18146

Int. Cl.² B23P *19/06*

U.S. Cl. 144—32 R **5 Claims**



1. An automatic screwdriving machine driven by pneumatic pressure delivered to it through an air conduit and the machine being supplied through a screw conveying conduit with one screw at a time from screw feeding apparatus in response to a change of pressure in a pressure sensing conduit extending from the screw driving machine to the screw feeding apparatus, said screw driving machine comprising:

a body having a rear end and a front end and having bore means including at least one bore extending through said front end;

a pneumatic motor in the body and carrying a screwdriver head extending a fixed distance from the front end of the body parallel to said bore means and offset therefrom, the pneumatic motor being connected with said air conduit;

a tubular screw receiving nose having a screw receiving chamber coaxial with the screwdriving head, the nose having rearwardly extending rod means offset from the chamber and reciprocably mounted in said bore means and attaching the nose to the body;

spring means surrounding the rod means and urging the nose frontwardly with respect to the body to an extended position wherein a portion of the screw receiving chamber extends beyond the screwdriving head, said screw conveying conduit obliquely joining said portion of the screw receiving chamber, and the nose progressively retracting so that the rod means moves rearwardly in said bore means while a screw within said chamber is being driven; and

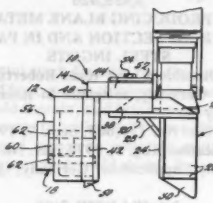
valve means in said at least one bore responsive to the position of the rod means in the bore to selectively couple air pressure from said air conduit with said pressure sensing conduit, the valve means being operative each time the nose returns to extended position to deliver to the sensing conduit a change in pressure which actuates said screw feeding apparatus to supply a screw through the screw conveying conduit to said chamber.

3,958,615

TREE CUTTING APPARATUS WITH IMPROVED CUTTING BLADE CONSTRUCTION

Walden M. Gaitten, Sylacauga, Ala., assignor to Kockum Industries, Inc., Talladega, Ala.

Division of Ser. No. 365,977, June 1, 1973, Pat. No. 3,837,382.
This application Sept. 12, 1974, Ser. No. 505,608
Int. Cl.² A01G *23/08*
U.S. Cl. 144—34 E **3 Claims**



1. In a tree felling apparatus having a cutting head including a cutting part movable through an arcuate cutting stroke about an axis which has a substantial horizontal extent, the improvement in combination therewith which comprises said cutting part including a cutting blade having a forward cutting edge, a concave upper surface and a convex lower surface, said upper and lower surfaces extending in a forward-to-rearward direction arcuately about the pivotal axis of said cutting part, said cutting blade having lug means rigidly secured thereto extending from the lower convex surface thereof for splitting the tree stump in operation, said lug means having laterally outwardly facing side surfaces which are inclined symmetrically with respect to a plane passing centrally through the cutting blade in perpendicular relation to the axis of movement of said cutting part.

3,958,616

PURSE APPARATUS

Jean E. Beverstock, 1511 Nuuanu Ave., Honolulu, Hawaii

Filed Jan. 15, 1974, Ser. No. 433,440
Int. Cl.² A45C *13/00*
U.S. Cl. 150—30 **11 Claims**

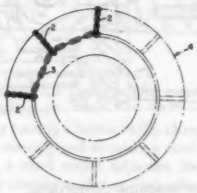
1. The purse apparatus comprising a bag having spaced opposite side facings joined by a bottom facing and end facings, thereby forming an upward opening receiver, a flap connected to an upper edge portion of one side facing and extending over the upward opening receiver to another side of the opposite side facing, and fastening means connected to the flap and to the opposite side facing for securing the flap to the opposite side facing in a closing of the upward opening receiver, and a false flap connected to the upper edge portion of said one side facing and extending downward over said one side facing for foiling pickpockets.

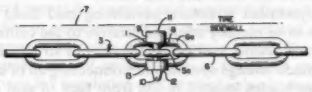
3,958,617

CONNECTOR FOR CHAINS

Christ N. Shaffer, Great Falls, Mont., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed Nov. 15, 1974, Ser. No. 524,326
Int. Cl.² B60C *27/00*
U.S. Cl. 152—241 **7 Claims**





1. In combination, with a tire chain including a pair of circumferentially disposed side chain members adapted to lie against the opposite side walls of the tire with at least some links lying in planes which intersect the side walls of the tire, and at least one cross chain member, a connector element adapted for non-swivel securing connection of a link of each cross chain member to one of said links of each side chain member when the former is received through the latter from one side to the other, said connector comprising:

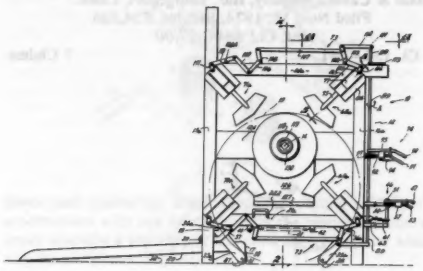
a. an elongated pin;
   1. a first head carried at one end of said pin,
   2. a second head carried at the opposite end of said pin,
   3. both of said heads forming a circumferential shoulder with said pin,
   4. said first head having an enlarged body to prevent passage through said link of said cross chain member and being adapted to be disposed between the link of the side chain member through which it is received and the adjacent side wall of the tire for engagement thereby, and
   5. said second head having a body adapted to pass through said link of the cross chain; and

b. a locking means received over said second head to engage with said shoulder, said locking means having:
   1. an enlarged body to prevent withdrawal of said second head through said link of the cross chain member and to maintain said last mentioned link in said received position.

3,958,618
TIRE CHANGER MACHINE

Maurice A. Reuther, 225 N. Ashbrooke Circle, Fort Mitchell, Ky. 41017

Filed Oct. 1, 1974, Ser. No. 510,924
Int. Cl.² B60C 25/08
U.S. Cl. 157—1.2 13 Claims



1. A tire changer machine comprising,

a main frame having a center axis, a front face and a rear face said center axis being generally horizontal, and each of said faces being in a generally vertical plane,

a plurality of bead breaker blades fixed to said main frame in each of the front and rear faces,

blade adjustment structure permitting said bead breaker blades to be radially adjusted relative to the center axis of said main frame, said blade adjustment structure including a blade linkage system interconnecting all of said bead breaker blades located in the front face of said machine with all the bead breaker blades located in the rear face of said machine, said linkage system being structured such that all of said blades are adjusted simultaneously and equally relative to the center axis of said main frame;

floor structure connected to said main frame, said floor structure being vertically adjustable so as to permit positioning of a tire thereon in concentric relation with the center axis of said main frame,

a ram coaxially aligned with the center axis of and connected to said main frame, said ram being adapted to reciprocate between a retracted position and an extended position relative to the front and rear faces of said main frame, and

a holder structure mounted on said rim, said structure being adapted to mount either a rim or a wheel on said ram in fixed relation thereto.

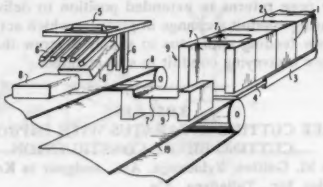
3,958,619
METHOD FOR THE SEPARATION OF CASTINGS FROM CASTING MOULDS OR SIMILAR MATERIAL AND A FOUNDRY MACHINE FOR CARRYING OUT THIS METHOD

Carl Herbert Petersen, Vaerlose, and Marius Günnergaard, Lyngby, both of Denmark, assignors to Dansk Industri Syndikat A/S, Herlev, Denmark

Filed Jan. 31, 1974, Ser. No. 438,366
Claims priority, application Denmark, Feb. 6, 1973, 631/73
Int. Cl.² B22D 17/22, 29/00
U.S. Cl. 164—131 6 Claims

1. A method for two stage separation of castings from breakable casting moulds, comprising the steps of:

cutting out and removing the castings together with an encasing lump of substantially exclusively heat damaged mould material from the remaining, surrounding parts of each casting mould undamaged by heat; and then

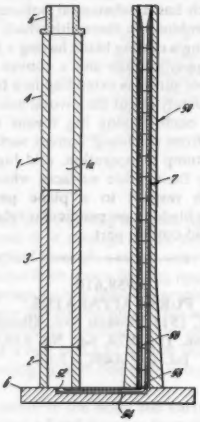


separately removing the mould material forming said encasing lump from said casting.

3,958,620
METHOD FOR PRODUCING BLANK METAL INGOTS OF UNIFORM CROSS SECTION AND IN PARTICULAR STEEL INGOTS

Guido Reuter, Dusseldorf, and Hans Robertz, Monchengladbach, both of Germany, assignors to Rheinstahl Giesserei A.G., Germany

Continuation of Ser. No. 179,007, Sept. 9, 1971, abandoned.
This application Aug. 9, 1974, Ser. No. 496,296
Claims priority, application Germany, July 16, 1970, 2035251
Int. Cl.² B22D 7/00
U.S. Cl. 164—133 2 Claims



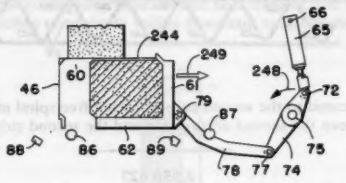
1. A method of casting steel ingots with no taper and no draft, having a length in excess of 2 meters, a minimum diameter of 250 mm, and a uniform cross-section throughout the length thereof, comprising the steps of providing an undivided vertically elongated upright mold of iron having a length of at least 2 meters with an inner cross-section which is uniform throughout the length of the mold which mold has a weight of at least 1.3 times the ingot weight, supplying molten steel into the mold at the center of the bottom end thereof, to flow upwardly through the mold, while maintaining the temperature of the steel at as low a pouring temperature as possible, and maintaining a rate of rise of the steel in the mold, of from 10 to 80 cm/minute to form the ingot, and subsequently dividing the ingot into sections having equal lengths and weights.

3,958,621

HORIZONTAL STACK MOLDING MACHINE

Edmond K. Hatch, Brecksville, Ohio, assignor to The Osborn Manufacturing Corporation, Cleveland, Ohio

Filed Oct. 10, 1972, Ser. No. 296,162
Int. Cl.² B22C 15/08
U.S. Cl. 164—173 22 Claims



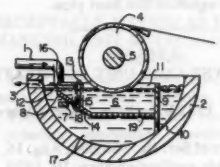
1. A horizontal stack foundry molding machine comprising an open ended box, means to close the open ends of said box and form a mold therein, said box comprising a stationary top and side wall, mans to horizontally move the opposite side and bottom wall, and means to maintain said bottom wall in a position to support such mold during its course of horizontal movement.

3,958,622

APPARATUS FOR CONTINUOUSLY MANUFACTURING ENDLESS LEAD SHEET

Tokunobu Sumida, Takehara, Japan, assignor to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Division of Ser. No. 443,636, Feb. 19, 1974. This application Nov. 15, 1974, Ser. No. 524,306
Claims priority, application Japan, Feb. 23, 1973, 48-23478[U]
Int. Cl.² B22D 11/06
U.S. Cl. 164—276 4 Claims



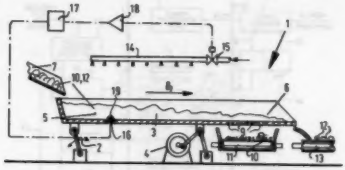
1. An apparatus for manufacturing an endless lead sheet from which a cathode starting sheet to be used in electrolytic refining of lead is prepared, including a casting tank adapted to contain molten lead and dross and a cooling drum rotatably mounted on said tank and partially immersed in the molten lead and dross, characterized by the provision of a dish mounted in said tank and surrounding the bottom of said drum such that a portion of said dish extends above the level of the molten lead and dross, the dish having a laterally extending, shallow cut-out at an upper end thereof, pouring means located externally of said dish to feed molten lead and dross to the casting tank, and a vertically adjustable gate device, a portion of which extends above the level of the molten lead and dross, arranged in the dish between said cut-out and said cooling drum whereby chambers are formed for the separation of the dross from the molten lead.

3,958,623

COOLER-DRIER FOR CASTINGS AND MOULDING SAND

Bastiaan Vissers, Heemstede, and Willem Teunissen, Amstelveen, both of Netherlands, assignors to Expert N.V., Willemstad, Netherlands

Filed June 28, 1974, Ser. No. 484,103
Claims priority, application Netherlands, July 16, 1973, 7309900
Int. Cl.² B22C 5/08
U.S. Cl. 164—412 3 Claims



1. A cooler-drier for castings and moulding sand comprising, in combination:

a cooler-drier having a horizontally elongate conveying path defining a casting and moulding sand inlet at one end of said path, a sand outlet adjacent the other end of said path and a casting outlet at said other end of the path;

means for feeding a mixture of hot castings and sand to said inlet;

water spray means for directing water onto the mixture as it travels along said path and including a control valve for controlling the quantity of water so directed; and

control means for causing said sand as delivered to said sand outlet to possess a uniform moisture content, said control menas comprising a temperature sensor for sensing the temperature of said mixture at said inlet and a control device for regulating said control valve in dependence on the temperature so sensed.

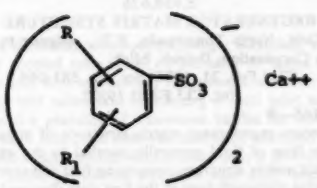
3,958,624

HEAT TRANSFER FLUIDS

Robert L. Peeler, Albany, and John M. King, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 352,152, April 18, 1973, Pat. No. 3,920,572. This application July 2, 1973, Ser. No. 375,970
Int. Cl.² C09K 5/00
U.S. Cl. 165—1 6 Claims

3. A heat transfer oil composition which comprises (1) a hydrocarbon oil, (2) from 0.05 to 5 weight percent of an oil-soluble barium overbased calcium sulfonate of the formula



wherein

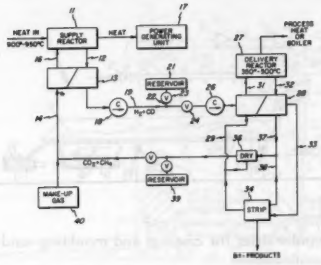
R is hydrogen or an alkyl having from 10 to 22 carbons, and

R_1 is an alkyl having from 3 to 10 carbons when R is alkyl and having from 8 to 22 carbons when R is hydrogen; and having a base ratio of at least 4 and (3) from 0.5 to 2 weight percent of 4,4'-methylene bis(2,6-di-tert-butylphenol).

3,958,625
TRANSPORT OF HEAT AS CHEMICAL ENERGY

Robert H. Wentorf, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed July 1, 1974, Ser. No. 484,802
Int. Cl.² F28D 15/00
U.S. Cl. 165—2 5 Claims



1. The process for transporting energy from a source of heat to an energy use area comprising the steps of:

a. reacting a first gas mixture consisting principally of methane and carbon dioxide adjacent said heat source at a temperature in excess of about 650°C to produce a second gas mixture consisting principally of carbon monoxide and hydrogen,

b. cooling said second gas mixture to a temperature below about 40°C,

c. pressurizing and transporting said second gas mixture through a first conduit to said energy use area,

d. heating said second gas mixture,

e. reacting said second gas mixture in the presence of steam and a catalyst at a temperature of at least about 350°C and a pressure of at least about 10 atmospheres to release heat and yield principally methane and carbon dioxide,

f. cooling the resulting mixture containing methane, carbon dioxide and water vapor below the condensation temperature for steam,

g. separating water and by-products formed in step (e) from the mixture containing methane, carbon dioxide and water vapor to produce said first gas mixture,

h. conducting the dried first gas mixture through a second conduit to said heat source,

i. heating said dried first gas mixture and

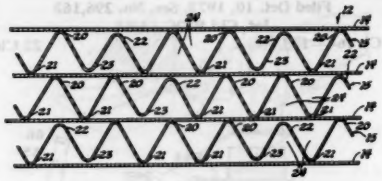
j. repeating the series of steps set forth above.

3,958,626
REGENERATOR MATRIX STRUCTURE

Lee F. Klein, North Tonawanda, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 21, 1975, Ser. No. 551,604
Int. Cl.² F28D 19/00
U.S. Cl. 165—8 2 Claims

1. A rotary regenerator matrix structure of annular form porous to flow of fluid generally parallel to the axis of the matrix, said matrix structure comprising first and second spiral wound strips with each turn of the first strip disposed between adjacent turns of the second strip and with said strips abutting face-to-face and fixed together into a rigid, elastic structure, said first strip having corrugations trending generally of the matrix, said corrugations including a repeatable series of a plurality of first corrugations each uniformly of substantial depth radially of the matrix and at least a second corrugation of reduced radial depth as compared to said first corrugations, said first corrugations of said first strip abutting at their radially extreme portions against adjacent turns of said second strip and being fixed thereto, the second corrugation being

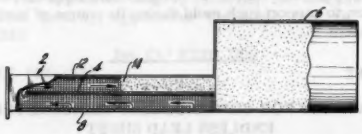


unsecured to the second strip to permit free spiral movement between the second corrugation and the second strip.

3,958,627
TRANSVERSE VARIABLE CONDUCTANCE HEAT PIPE

Frederick Edelstein, Hauppauge, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Oct. 15, 1974, Ser. No. 515,433
Int. Cl.² F28D 15/00
U.S. Cl. 165—32 12 Claims



1. A transverse variable conductance heat pipe which comprises a closed elongated casing having wicking means on the interior walls, a vaporizable liquid and a non-condensible gas therein; said closed elongated casing having transverse baffle means positioned therein to cause vaporized liquid to flow in a longitudinal direction; a reservoir for said non-condensible gas, said reservoir being in open communication with said closed elongated casing and means at the opposite end of the heat pipe from the reservoir to communicate the reservoir with the condenser region of the heat pipe.

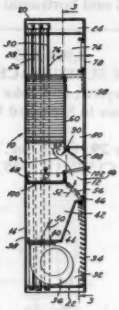
3,958,628
VERTICAL BLOWER COIL UNIT FOR HEATING AND COOLING

William R. Padden, 13823 Heritage Drive, Riverview, Mich. 48192

Continuation-in-part of Ser. No. 388,898, Aug. 16, 1973, Pat. No. 3,908,752. This application Mar. 19, 1975, Ser. No. 559,996
Int. Cl.² G05D 23/00; F16K 1/16
U.S. Cl. 165—35 8 Claims

4. An apparatus for heating and cooling comprising a cabinet, an air inlet in the lower portion of the cabinet and an air outlet in the upper portion thereof, a pair of parallel passageways in said cabinet between said air inlet and said air outlet, heat transfer coil means for the passage of liquid of preselected temperature in one of said passageways, means to flow cold or hot liquid therethrough, means for directing a flow of air from said air inlet to said air outlet, a pivotally mounted damper element in said cabinet pivotable to positions blocking one or the other of said passageways while permitting free flow of air through the unblocked passageway, a reversible electric damper motor connected to said damper element for pivoting of same, control means to energize said air flow directing means and said damper motor in response to temperature requirements of the area being served, said control means in response to a first temperature requirement being

operative to energize the damper motor to pivot the damper element to a position opening the passageway in which said heat transfer coil means is positioned and block the other passageway, said control means in response to a second temperature requirement being operative to energize the damper motor to pivot the damper element to close the passageway in which the heat transfer coil means is positioned to prevent the flow of air over the heat transfer coil means at that time and open the other passageway to permit the flow of air therethrough to said air outlet, and a relatively deep collecting pan in said one passageway beneath said heat transfer coil means for collecting condensate falling from said heat transfer coil



means when cold liquid is passed therethrough and for use as a water reservoir for humidifying air passing through the unit during periods of time when hot liquid is passed through said heat transfer coil means and said one passageway is open, means for filling said collecting pan with water during periods of time when water is required for humidifying purposes, said last mentioned means including a float structure in said pan, valve means operated by said float structure, conduit means leading from a source of water supply to said collecting pan, said valve means being located in said conduit means, said float structure being operative to open and close said valve means to maintain the desired level of water in the pan.

3,958,629

FLUID RECEPTACLE HAVING AT LEAST ONE HEAT EXCHANGING UNIT DETACHABLY MOUNTED THEREIN

Sven Erik Alvar Andersson, Sodertalje, Sweden, assignor to AB Svenska Maskinverken, TarFalla, Sweden

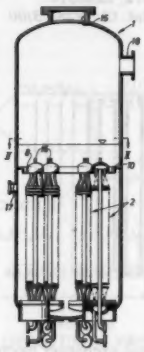
Filed Dec. 20, 1974, Ser. No. 534,811

Claims priority, application Sweden, Dec. 21, 1973, 73174187

Int. Cl.² F28D 7/10

U.S. Cl. 165—74 **7 Claims**

1. A fluid receptacle for exchanging heat between a first fluid flowing through at least one heat exchanging unit and a second fluid received in a fluid receptacle chamber, the receptacle comprising: a fluid receptacle chamber having a wall defining an interior space and means for receiving said second fluid; heat exchanging unit means detachably mounted in the interior of said receptacle; an exchanger opening through the wall of said receptacle at a first location; a manhole opening through the wall of said receptacle at a second location spaced from said first location; a supporting flange integral with the wall of said receptacle, around the periphery of said exchanger opening, and defining a supporting surface facing the interior of said receptacle for supporting said heat exchanging unit means; an end flange at one end of said heat exchanging unit means defining an abutment surface facing away from said heat exchanging unit means and toward said supporting surface, for contacting and being supported by said supporting surface; inlet and outlet conduits for the passage of said first fluid, mounted on said end flange, and extending away from said heat exchanging unit means and through said exchanger opening; and mounting means for detachably sealingly mounting said heat exchanging unit means in the interior of said



receptacle; wherein the size of said exchanger opening enables the unobstructed passage of said inlet and outlet conduits therethrough; and wherein the size of said manhole opening enables the unobstructed passage of said heat exchanging unit means therethrough.

3,958,630

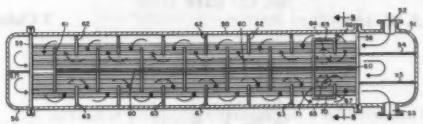
HEAT EXCHANGER BAFFLE ARRANGEMENT

Hosea E. Smith, Baytown, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Jan. 24, 1975, Ser. No. 543,836

Int. Cl.² F28F 9/22

U.S. Cl. 165—161 **10 Claims**

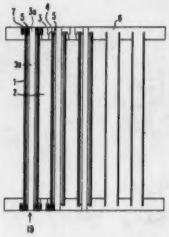


1. In a shell and tube heat exchanger including a first tube sheet, a second tube sheet, a plurality of tubes extending between said first and second tube sheets, an outer shell surrounding said tubes and containing a shell inlet and a shell outlet, and a plurality of transverse baffles for directing the flow of shell side fluid between said shell inlet and said shell outlet, the improvement which comprises a first double segmented baffle positioned between said shell inlet and the adjacent tube sheet, a first longitudinal baffle member extending between said first double segmented baffle and the adjacent transverse baffle, a second double segmented baffle positioned between said shell outlet and the adjacent tube sheet, and a second longitudinal baffle member extending between said second double segmented baffle and the adjacent transverse baffle, said transverse and double segmented baffles being spaced at substantially equal intervals between said first and second tube sheets.

3,958,631
HEAT EXCHANGER FOR CATALYTIC GAS CONVERTERS

Hellmuth Mentschel, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 10, 1973, Ser. No. 423,120
Claims priority, application Germany, Dec. 11, 1972, 2260544; Dec. 11, 1972, 2260514
Int. Cl.² F28F *3/00*
U.S. Cl. 165—166 **7 Claims**



1. In a crossflow heat exchanger having a plurality of flow chambers separated from each other by heat exchange surfaces with the heat exchange surfaces separated on opposite sides by spacers and having edges attached to said spacers to seal the chambers, the spacers having portions at areas where they abut the heat exchange surfaces which are surface sections parallel to and essentially of the same thickness as the heat exchange surfaces, the improvement comprising:

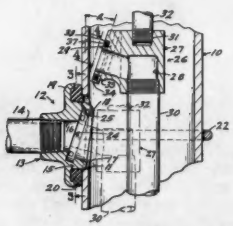
a. spacers having a profile such as to present parallel surface sections having edges directed toward the outside of the chambers; and

b. a gas tight welded seam welding the edges of each parallel surface section to the edge of a heat exchanger surface.

3,958,632
WELL PIPE CONNECTOR

Michael A. Buchman, Arcadia, Ohio, and Neil A. Reinhard, Paonia, Colo., assignors to Dicken Manufacturing Company, Arcadia, Ohio

Filed Aug. 27, 1975, Ser. No. 608,057
Int. Cl.² E21B *33/03*
U.S. Cl. 166—85 **7 Claims**

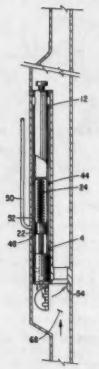


1. A well pipe connector for connecting an external horizontal pipe to a vertical pipe extending within a hollow well casing, comprising, in combination, a first unit having a sleeve for connection to said horizontal pipe extending through a generally annular seat, said seat having an enlarged external portion for engagement with the exterior of said well casing over an aperture therein and an internal poriton extending into said aperture with its lower periphery resting upon the lower edge of said casing aperture and the remaining periphery being generally flush with the inner surface of said casing with a blind channel extending into said internal portion of said sleeve from the upper periphery thereof downwardly at an angle outwardly toward the casing exterior and terminating in the lower portion of said enlarged external portion; and a second unit for releasable connection to said first unit and including an angled fluid passage having a lower end for connection to said vertical pipe and the other end extending through a generally planar flange adapted to be slideably received by said blind channel on said first unit, said planar flange being positioned at an angle with respect to the lower end of said angled fluid passage whereby said lower end is in vertical position parallel to said casing when said flange is inserted within said blind channel to connect said first and second units to provide a continuous fluid passage between said vertical pipe and said horizontal pipe.

3,958,633
FLAPPER-TYPE SUBSURFACE SAFETY VALVE

James A. Britch, Lafayette, and John R. Smith, New Orleans, both of La., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 29, 1975, Ser. No. 581,602
Int. Cl.² E21B *7/06, 43/12*
U.S. Cl. 166—117.5 **4 Claims**



1. A downhole safety valve for use in a tubing string having a side pocket and a seat in said tubing string adjacent said pocket for use with a kickover tool which comprises:

an operator including a body member attachable to said kickover tool and settable in said pocket,

a valve supported by said body and operable by said operator to open or close against said seat in said tubing string.

3,958,634
WELDED WIRE WELL SCREEN ON PERFORATED CASING

Howard F. Smith, III, Houston, Tex., assignor to Howard Smith Company, Houston, Tex.

Filed Oct. 31, 1972, Ser. No. 302,425
Int. Cl.² E21B *43/08*
U.S. Cl. 166—233 **2 Claims**

1. A well screen adapted for use in deep wells, comprising:

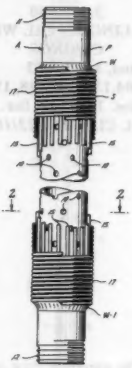
a tubular pipe having a perforated pipe section and adapted to be disposed longitudinally in a well for receiving well fluid in said pipe;

a wire screen sleeve unit having circumferentially spaced longitudinally extending rib wires and a screen wire wrapped externally of said rib wires in a spaced pattern to form a screen passage for well fluids through said wire screen sleeve unit, said screen wire secured to said rib wires by welding at each crossing point to form said sleeve unit in a desired length to cover the perforated

pipe section as a unitary assembly which is self supporting;

said wire screen sleeve unit having an internal diameter sized relative to the external diameter of the tubular pipe for enabling the wire screen sleeve unit to be movably positioned relative to the pipe when said wire screen sleeve unit is unsecured with said tubular pipe;

said wire screen sleeve unit being disposed around and movable relative to said pipe section for positioning about said perforated pipe section with said rib wires located substantially in contact with said pipe and with the screen wire spaced radially outwardly from said pipe to form radial gaps at each end of said wire screen sleeve unit;



means for securing said wire screen sleeve unit with said pipe and against longitudinal and rotational movement relative to said pipe under all conditions of tension and torsion including an annular weld at each end of said wire screen sleeve unit for closing off said radial gaps at each end of said wire screen sleeve unit for closing off fluid flow through the ends of said wire screen sleeve unit;

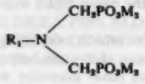
said annular welds having an exernal diameter which is not greater than the external diameter of the wire screen sleeve unit so that the well screen may be lowered into any space which will receive the wire screen sleeve unit.

3,958,635
METHOD OF INHIBITING SCALE FOR HIGH TEMPERATURE STEAM WELLS

Horst E. Zilch, Yorba Linda, and Paul W. Fischer, Whittier, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Sept. 26, 1975, Ser. No. 617,241
Int. Cl.² C02B 5/06; C23F 14/02; E21B 43/00
U.S. Cl. 166—244 C **9 Claims**

1. A method for inhibiting the formation of scale from geothermal fluids having a temperature above about 400°F., which comprises adding to the geothermal fluid a scale-inhibiting amount of a scale inhibitor comprising a substituted iminodi(methylene phosphonic acid) or a water-soluble salt thereof having the following formula

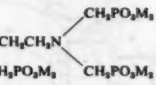


wherein R_1 is

i. $-CH_2PO_3M_2$

ii.

iii. or

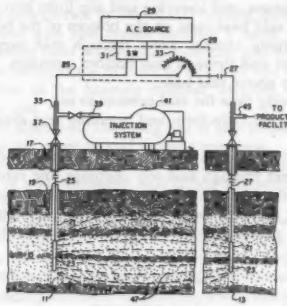
iv. 

and M is hydrogen, an alkali metal or an ammonium cation.

3,958,636
PRODUCTION OF BITUMEN FROM A TAR SAND FORMATION

Thomas K. Perkins, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 23, 1975, Ser. No. 543,458
Int. Cl.² E21B 43/22, 43/24
U.S. Cl. 166—248 **9 Claims**



1. A method of producing bitumen from a subterranean tar sand formation containing viscous bitumen while heating said formation via electrical conduction between a plurality of wells completed therein, which comprises the steps of:

a. maintaining a high back pressure on said wells,

b. injecting a fluid that is immiscible with said bitumen through at least one of said wells and into said tar sand formation, thereafter

c. interrupting electrical power transmission to said formation and releasing said pressure on said wells, and thereafter

d. producing said bitumen from at least one of said wells.

3,958,637
TECHNIQUE FOR LINING SHAFT

James H. Cobbs, Tulsa, Okla., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

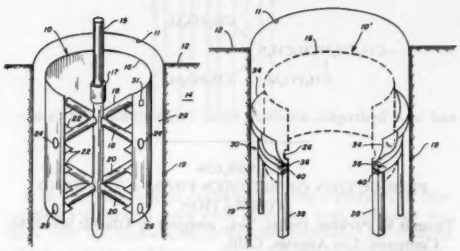
Filed May 22, 1975, Ser. No. 580,111
Int. Cl.² E21B 33/13
U.S. Cl. 166—287 **5 Claims**

1. The method of remote cement lining of a deep, large

diameter, borehole in the earth, filled with drilling fluid, comprising the steps of:

a. providing a base on which said lining is to be supported at a selected distance above the bottom of said borehole, said base having an inner diameter which is the same as that of the finished liner, and means to seal against the wall of said borehole;

b. providing a slip form means, with support conduit means to support said slip form, the outer diameter equal to the internal diameter of said liner, said support conduit connected by pipes through the cylindrical wall of said slip form at one or more openings near the bottom, and at one or more openings near the top of said cylindrical wall;



c. attaching said base to said slip form with shearable fastening means, and lowering said slip form into the borehole until said base rests on the bottom of the borehole;

d. pumping cement down through said support conduit means and through said bottom openings, and into the space above said base;

e. allowing time for said cement to set;

f. lifting said slip form and breaking said shear fastenings; and

g. slowly continuously lifting said slip form, while pumping cement through said top openings, the rate of pumping and the rate of lifting being adjusted so that the cement liner is supported at each level, by said slip form, for a time greater than the time for the cement to have a first set.

3,958,638

METHOD FOR ALTERING THE PERMEABILITY OF A SUBTERRANEAN FORMATION

Chester C. Johnston, Dewey, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 16, 1975, Ser. No. 587,182

Int. Cl.² E21B *33/138*

U.S. Cl. 166—294 **15 Claims**

1. A method for altering the permeability of a subterranean hydrocarbon-containing formation penetrated by at least one wellbore, comprising:

1. passing aqueous polymer solution into the formation, said polymer capable of reaction to increase the viscosity of the aqueous polymer solution;

2. passing into the formation a gelation agent which is in an encapsulating material and which is capable of reaction with said polymer to increase the viscosity thereof, said encapsulating material capable of releasing the gelation agent in situ in response to the temperature of the subterranean formation; and

3. subjecting said encapsulating material to a temperature sufficient to release said gelation agent whereby contact between the gelation agent and aqueous polymer solution increases the viscosity of the aqueous polymer solution.

3,958,639

METHOD OF DRILLING AN OIL WELL TO RECOVER CASINGS

Arlie H. Daniel, 2630 Belle Chasse, Gretna, La. 70053

Filed June 28, 1974, Ser. No. 484,136

Int. Cl.² E21B *33/13*

U.S. Cl. 166—294 **2 Claims**

1. The method of drilling an oil well to ultimately recover a surface casing and to assure of the return flow of drilling fluid back to surface mud pits and to prohibit the outer walls of the surface casing from being permanently sealed to the wall of a bore hole comprising, drilling a bore hole, inserting the surface casing of lesser external diameter than the diameter of the bore hole, releasably effecting a temporary seal between the outside of the surface casing and the bore hole to compel return of drilling fluids with the casing up to the pits, overcoming the temporary seal by axially withdrawing the casing from the bore hole.

3,958,640

METHOD OF DRILLING AN OIL WELL TO RECOVER CASINGS

Arlie H. Daniels, Gretna, La. 70053

Division of Ser. No. 484,136, June 28, 1974, abandoned. This application Dec. 12, 1974, Ser. No. 532,162

Int. Cl.² G21B *23/100*

U.S. Cl. 166—315 **2 Claims**

1. The method of drilling an oil well to ultimately recover a surface casing and to assure of the return flow of drilling fluid back to surface mud pits and to prohibit the outer walls of the surface casing from being permanently sealed to the wall of a bore hole comprising, drilling a bore hole, inserting the surface casing of lesser external diameter than the diameter of the bore hole, releasably effecting a temporary seal between the outside of the surface casing and the bore hole to compel return of drilling fluids within the casing up to the pits, inserting a drill string and further drilling the bore hole, overcoming the temporary seal and axially withdrawing the casing from the bore hole.

2. The method of drilling an oil well to ultimately recover a surface casing and to assure of the return flow of drilling fluid back to surface mud pits and to prohibit the outer walls of the surface casing from being permanently sealed to the wall of a bore hole comprising, drilling a bore hole, inserting the surface casing of lesser external diameter than the diameter of the bore hole and having at least one deflated inner tube about the outside of said casing, releasably effecting a temporary seal between the outside of the surface casing and the bore hole by inflating said inner tube with a fluid to cause said

inner tube to purchase against the bore hole to compel return of drilling fluids within the casing up to the pits, a drill string and further drilling the bore hole, overcoming the temporary seal by deflating the inner tube and axially withdrawing the casing from the bore hole.

3,958,641

SELF-DECENTRALIZED HYDRA-JET TOOL

Floyd E. Dill, and Bert O. Brown, both of Midland, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Mar. 7, 1974, Ser. No. 448,836
Int. Cl.² E21B *21/00, 37/00*
U.S. Cl. 166—312 **19 Claims**

1. Apparatus for use with a source of pressurized treating fluid for jet treating well bores or the like, comprising:

a flexible conduit positionable within the well bore and having an upper end portion and a lower end portion;

first connecting means on the upper end portion of said flexible conduit for connecting said conduit in communication with the source of pressurized treating fluid;

a jet treating head having a cavity formed therein and connecting means formed thereon for connecting the lower end portion of said flexible conduit to said jet treating head in communication with the cavity formed therein;

first treating nozzle means formed in said jet treating head and extending outwardly from the cavity therein in a first direction for ejecting pressurized treating fluid therethrough in the first direction towards a point of contact with said well bore and exerting a reaction force on said jet treating head in a second direction opposite said first direction; and

second decentralizing nozzle means formed in said jet treating head and extending outwardly from the cavity in the second direction for ejecting pressurized treating fluid therethrough from said jet treating head in the second direction and exerting an opposite reaction force in the first direction on said jet treating head greater than the opposite reaction force in the second direction associated with said first treating nozzle means.

14. A method of jet treating the side of a zone of a well or the like with pressurized fluid, comprising the steps of:

A supporting a jet treating head within said zone of said well;

B supplying pressurized fluid to said head;

C decentralizing the jet treating head by the reaction of unbalanced fluid jets so as to urge the jet treating head toward a side of said zone; and

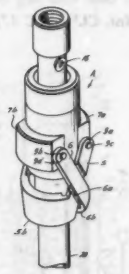
D directing a treating fluid jet adjacent to said side toward said side to thereby jet treat said side.

3,958,642

QUICK LATCHING DRILL PIPE BLOWOUT PREVENTER AND METHOD OF USE THEREOF

Malcolm G. Coone, Houston, Tex., assignor to Lynes, Inc., Houston, Tex.

Filed Sept. 2, 1975, Ser. No. 609,606
Int. Cl.² E21B *19/00, 43/00*
U.S. Cl. 166—315 **20 Claims**



1. A blowout preventer for the drill string of a subterranean well comprising:

a. First and second tubular housing members;

b. Means defining a valve within one of said tubular housing members;

c. Means carried by one of said housing members for grasping a well tool joint on said drill string;

d. Seal elements carried by one of said housing members for cooperation with said means defining a valve to selectively contain fluid within said apparatus and to prevent fluid flow between the exterior of said well tool joint and the interior of the housing member carrying said seal elements; and

e. Means for selectively removing one of said housing members from the other of said housing members.

18. A method of containing well and drilling fluids within the drill pipe of a subterranean well during a blowout of said well through said drill pipe comprising the steps of:

a. Affixing to the lower end of a kelly joint a blowout preventer comprising: (1) first and second tubular housing members; (2) means defining a first valve within one of said tubular housing members; (3) means carried by one of said housing members for grasping a well tool joint; (4) seal elements carried by said housing members for cooperation with said means defining a valve for containment of fluid within said apparatus; (5) means for selectively removing one of said housing members from the other of said housing members; and (6) means on the first of said housing members for engaging said well tool joint before the other of said housing members is removed from the first of said housing members;

b. Sealingly engaging said blowout preventer onto the upper end of said drill pipe to direct flow of said fluids from said drill pipe into said kelly joint;

c. Activating said means on one of said housing members for engaging said tool joint;

d. Closing said valve to prevent said fluid from passing through said drill pipe to said kelly joint;

e. Removing the housing member carrying the means for grasping the well tool joint;

f. Connecting to the lower end of said kelly joint a sub having a second valve element preventing upward flow of fluid through the sub and permitting downward flow of fluid through the sub; and

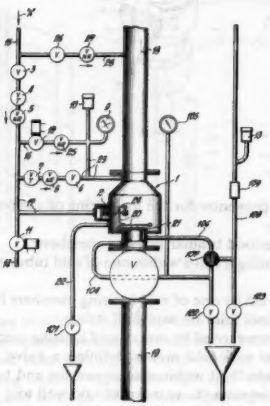
g. Engaging said sub to the upper end of said tubular housing member having therewithin said means defining a first valve.

3,958,643

SPRINKLER SYSTEM AND METHOD OF OPERATING THE SAME

Ernst Landsberg, Bergisch-Gladbach, Germany, assignor to Walther & Cie Aktiengesellschaft, Cologne-Dellbrueck, Germany

Division of Ser. No. 414,539, Nov. 9, 1973, Pat. No. 3,888,314.
This application Dec. 11, 1974, Ser. No. 531,618
Claims priority, application Germany, Nov. 11, 1972, 2255369
Int. Cl.[2] A62C 37/06
U.S. Cl. 169—43 6 Claims



1. A method of operating a sprinkler system having a pressurized sprinkler conduit which is separated from a water supply by a normally closed valve, and a fire alarm system which is connected with said valve and opens the same in response to detection of a fire by the alarm system, comprising the steps of normally maintaining said valve closed unless a pressure loss in said sprinkler conduit and a detection of fire by said fire alarm system coincide; detecting when said alarm system is inoperative; and opening said valve in response to such detection so that the sprinkler system thereafter can operate in response to the occurrence of a pressure loss in said sprinkler conduit.

3,958,644

PRESSURE SENSITIVE EXPLOSION BARRIER

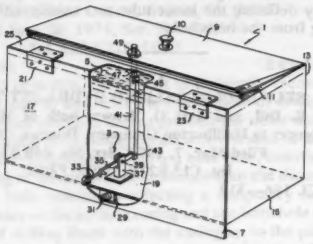
Israel Liebman, Library; John Corry, Elrama, and J. Kenneth Richmond, Pittsburgh, all of Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed July 2, 1975, Ser. No. 592,488
Int. Cl.[2] A62C 3/00
U.S. Cl. 169—56 9 Claims

1. An explosion suppression device comprising:

a closed container having a normally locked and openedly biased door for retaining an explosion suppression agent, said container having an ambient pressure responsive plate; and

mechanical means for unlocking said door in response to a static pressure rise of as little as one pound per square inch increase in ambient gaseous pressure on said plate,



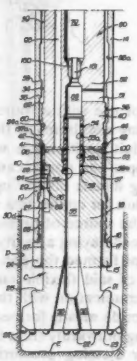
whereby the suppression agent is released from the container.

3,958,645

BORE HOLE AIR HAMMER

Alfred R. Curington, Spartanburg, S.C., assignor to Baker-drill, Inc., Spartanburg, S.C.

Continuation-in-part of Ser. No. 246,837, April 24, 1972. This application Feb. 11, 1974, Ser. No. 440,960
Int. Cl.[2] E21B 5/00; E21C 7/00
U.S. Cl. 173—17 13 Claims



1. Percussion drilling apparatus: comprising a housing structure having an inner wall and connectible to a drill string; an anvil in the lower portion of said housing structure and operatively connectible to a drill bit; a hammer piston reciprocable in said housing structure for intermittently impacting against said anvil; means for directing a fluid medium under pressure into said housing structure for action upon said piston to effect reciprocation of said piston in said housing structure; said piston having short upper and lower end sealing portions contacting the inner wall of said housing structure, said piston having upper and lower guide portions above and below said upper and lower end sealing portions, respectively, contacting the inner wall of said housing structure, said piston being relieved along its entire length between said end portions to be free from contact with said inner wall along the entire length of said piston between said end portions, the exterior of said piston being unsupported along its entire length between said end portions, said relieved length of said piston being substantially greater than the total of the wall contacting lengths of said end portions and guide portions; and piston having cen-

tral passage means therein; flexible tubular means through which the fluid medium can flow extending into said passage means in relative slidable relation to said piston, said flexible tubular means being capable of being flexed by said piston to permit movement of said piston laterally of the normal axis of said housing structure.

3,958,646

PENETROMETER FRAMES

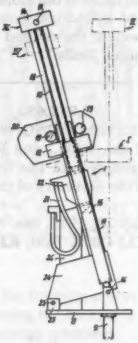
Charles Marc Marie Saint-Remy Pellissier, Avignon, France, assignor to Societe Anonyme Fondasol-Technique, Avignon, France

Filed Jan. 24, 1975, Ser. No. 543,953

Claims priority, application France, Jan. 29, 1974, 74.03871

Int. Cl.² G01N *3/42, 3/00*

U.S. Cl. 173—44 **7 Claims**



1. A penetrometer structure comprising:

a platform support;

a pair of upright first slides pivotally mounted on said support for tilting movement about a horizontal axis, said first slides having a vertical first position wherein they lie in a vertical plane spaced from said pivot and a tilted second position wherein said first slides are inclined to said vertical plane;

a movable member comprising a pair of movable slides shiftable along said first slides;

a cross-piece connecting said movable slides;

a pair of hydraulic rams pivotally connected to said support and to said member for tilting said first slides and elevating said member along said first slides;

a hammer mounted on said member and guided on said movable slides for movement therealong; and

guide means in said plane for guiding a set of tubes to be driven by said hammer downwardly from said support.

3,958,647

POWERFUL SUBMERSIBLE DEEPWATER PILE DRIVER POWERED BY PRESSURIZED GAS DISCHARGE

Stephen V. Chelminski, West Redding, Conn., assignor to Bolt Associates, Inc., Norwalk, Conn.

Filed June 4, 1975, Ser. No. 583,686

Int. Cl.² E02D. *7/00*

U.S. Cl. 173—127 **14 Claims**

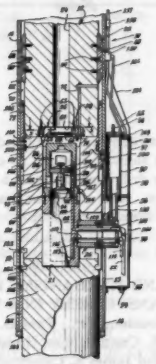
1. In a pile driver of the type powered by pressurized gas discharging apparatus and capable of operating partially or totally submerged in water or in air having an elongated cylindrical housing, an elongated cylindrical weight axially movable within the housing, a driving head movably mounted in the housing beneath the weight with pressurized gas discharging apparatus positioned within the housing for suddenly and repeatedly discharging pressurized gas causing the weight to move, the invention comprising

an annular cylindrical thrust-transmitting member positioned within the housing intermediate the weight and the driving head,

said annular member being secured to said driving head for forming a thrust-transmitting assembly, which is axially movable within the housing,

the interior of said thrust-transmitting assembly defining a discharge chamber,

pressurized gas discharging apparatus positioned within said thrust-transmitting assembly adapted for suddenly discharging pressurized gas into said discharge chamber therein,



shock absorber means for holding said gas discharging apparatus in axially movable relationship relative to said thrust-transmitting assembly, and

said thrust-transmitting assembly having an opening extending in a radial direction through its wall for providing communication with the gas discharging apparatus from an area external of the thrust-transmitting assembly, whereby the cylindrical weight and the thrust-transmitting assembly may move axially relative to the gas discharging apparatus.

3,958,648

DRILLING EQUIPMENT

Sven Goran Anders Gronblad, Vastra Frolunda, Sweden, assignor to BPA Byggproduktion AB, Goteborg, Sweden

Filed Feb. 13, 1975, Ser. No. 549,555

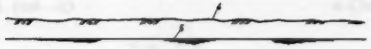
Claims priority, application Sweden, Feb. 18, 1974, 7402091; Feb. 18, 1974, 7402089

Int. Cl.² E21B *33/04, 11/02*

U.S. Cl. 175—21 **6 Claims**

1. Improvements in drilling equipment for drilling from rocks into strata of earth and sand, said equipment comprising a drilling unit incorporating a cutter head, casing sections positioned between said drilling unit and said cutter head, and drill rod sections extending through said casing sections and having an axial through channel for the drilling water, the improvements comprising in combination, a first seal made from metal, a second seal made of some softer material, such as rubber or plastics, said seals positioned adjacent one another between said casing and said cutter head and arranged to cooperate for the purpose of preventing ground water and mud from penetrating into said casing, a one way valve arranged in the drill water channel in the drill rod positioned just behind said cutter head, said one way valve formed in a manner known per se by a valve ball, a compression spring arranged to press said valve ball against a valve seat, the drill rod positioned closest to said cutter head being provided adjacent

said head with a drill water opening, a seal arranged behind said drill water opening and serving to prevent drill water from flowing between said drill rod and said casing in the direction towards said drill chamber, a pressure sleeve arranged between said casing and the wall of said drill hole, an annular



channel formed between said casing and said wall of the drill hole, said pressure sleeve arranged to close off said annular channel against the drill chamber, and a conduit for supply of pressurized medium, such as air or water, said conduit debouching into said annular channel.

3,958,649

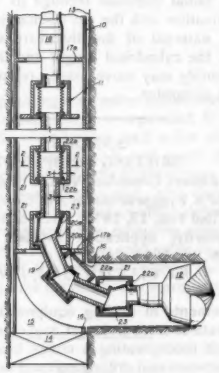
METHODS AND MECHANISMS FOR DRILLING TRANSVERSELY IN A WELL

George H. Bull, Houston, Tex.; Paul D. Bull, Charlottesville, Va., and James E. Cunningham, Houston, Tex., assignors to George H. Bull and James E. Cunningham, both of Houston, Tex., part interest to each

Substitute for Ser. No. 706,743, Feb. 5, 1968, abandoned. This application July 17, 1975, Ser. No. 596,596

Int. Cl.[2] E21B *7/08*

U.S. Cl. 175—61 **15 Claims**



1. A method for drilling in a transverse direction from a vertical well with a turbodrill means comprising the steps of,

a. lowering in the well to the desired depth an elongated cylindrical housing having a transverse opening adjacent the bottom thereof and an opening in the top thereof,

b. positioning a compressible and telescopic hydraulic fluid conduit of axially aligned spools interconnected with a cylindrical spring biasing means in the elongated cylindrical housing,

c. supplying a high pressure hydraulic drilling fluid through a drill pipe string to the top of the compressible and telescopic hydraulic fluid conduit in the elongated cylindrical housing for operating the turbodrill means at the bottom thereof,

d. extending the lower end of the compressible and telescopic hydraulic fluid conduit with the turbodrill means on the end thereof down into the elongated cylindrical housing,

e. compressing the cylindrical spring means between each pair of spools consecutively for moving the individual axially aligned spools of each pair closer together consecutively for turning the compressible and telescopic hydraulic fluid conduit from the vertical direction to the transverse direction, and

f. spring biasing the axially aligned spools of each pair in said compressible and telescopic hydraulic fluid conduit away from each other by expanding said cylindrical spring biasing means between each pair for forcing the turbodrill means thereon out from the transverse opening in the elongated cylindrical housing for drilling transversely of the well at the desired depth under high compressive and torque loads.

3,958,650

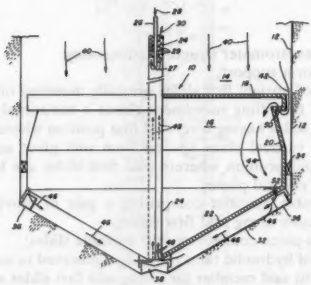
DRILLING SYSTEM USING WEIGHT OF MUD

James H. Cobbs, Tulsa, Okla., and Roger J. Morrell, Bloomington, Minn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed May 28, 1975, Ser. No. 581,408

Int. Cl.[2] C09K *7/00;* **E21B** *21/00*

U.S. Cl. 175—205 **8 Claims**



1. A drilling system for drilling large diameter holes comprising:

a. drill bit means having a top surface, a substantially cylindrical side wall and a bottom surface, a plurality of cutters on the bottom surface at selected radii, a drill pipe attached to and passing axially through said bit means to the bottom thereof, said drill bit top surface having a substantially larger area than said drill pipe;

b. sliding sealing means to substantially close off the flow of drilling liquid in the annulus between said bit means and the wall of said bore hole;

c. a plurality of orifices of selected size to permit the flow of drilling liquid from above said bit, through said bit to the bottom thereof, and up through said drill pipe;

d. means to introduce drilling liquid in the annulus between the drill pipe and the wall of the bore hole and air lift means in the top of said drill pipe to circulate said drilling liquid;

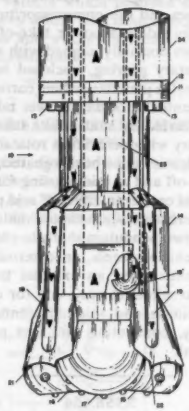
whereby a selected rate of flow of drilling liquid will be set up through said orifices, creating a pressure drop through said orifices of a selected value, and creating a hold down force on said bit of a selected value.

3,958,651

VACUUM, VACUUM-PRESSURE, OR PRESSURE CIRCULATION BIT HAVING JET-ASSISTED VACUUM

James Whitehurst Young, Irving, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed July 31, 1975, Ser. No. 600,540
Int. Cl.² E21B 9/18
U.S. Cl. 175—340 5 Claims



1. A rotary drill bit for forming a bore, comprising:
cutter means for forming the bore, said cutter means including a plurality of cutter members;
a body member rotatably supporting said cutter means, said body member having one end and another end, said body member supporting said cutter members in spaced relationship to engage and disintegrate the bottom of the bore upon rotation of said bit;
said body member having shield means projecting from said body member that projects proximate said cutter means with at least a first portion of said shield means having an outside diameter substantially equal to the outside diameter of said cutter means and substantially equal to the diameter of the bore, and at least a second portion having an outside diameter less than the outside diameter of said cutter means and less than the diameter of the bore;
a first passage means extending through said body member;
a second passage means spaced from said first passage means extending from one end to the other end of said body member; and
fluid communication means between said first and second passage means and intermediate said one end and said other end of said body member.

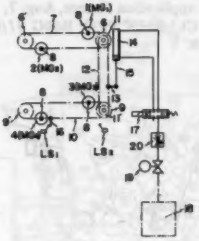
3,958,652

APPARATUS MOVABLY ADHERING TO A WALL AND ADAPTED TO CARRY A CLEANING APPARATUS

Fukashi Urakami, Kumamoto; Hiroyuki Yamashita, Tosu, and Katsumi Aoki, Kumamoto, all of Japan, assignors to Sanko Co., Ltd., Fukuoka, Japan

Filed Dec. 10, 1974, Ser. No. 531,492
Claims priority, application Japan, Dec. 11, 1973, 48-139112; Feb. 9, 1974, 49-16514; Mar. 30, 1974, 49-36801; July 19, 1974, 49-83699; Aug. 15, 1974, 49-94041; Sept. 24, 1974, 49-110129
Int. Cl.² B60S 3/02
U.S. Cl. 180—1 VS 18 Claims

1. An apparatus movably adhering to a wall comprising a body adapted to move along said wall, two pairs of adhering devices selectively operable to adhere to said wall, operable means operably mounting said two pairs of adhering devices on said body such that said adhering devices are movable in parallel directions with the two adhering devices in each pair being movable in opposite directions relative to one another, drive means for interlockingly driving said operable means in



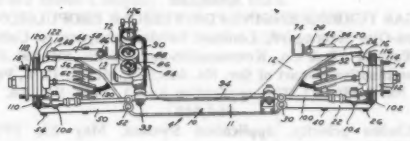
said parallel and opposite movable directions, and means for selectively switching said adhering devices on and off such that said adhering devices are operable to adheringly move said body along said wall.

3,958,653

MOTOR VEHICLE CHASSIS SUBASSEMBLY

Klaus H. Arning, Birmingham, and Robert J. Rumpf, Grosse Pointe, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed July 6, 1970, Ser. No. 52,235
Int. Cl.² B62D 5/06
U.S. Cl. 180—157 8 Claims



1. A motor vehicle chassis subassembly comprising a frame component and front wheel support means, suspension means interconnecting said wheel support means and said frame component, said suspension means being constructed to resiliently support said wheel support means for jounce and rebound movement relative to said frame component, steering gear means secured to said frame component, said steering gear means having an input shaft constructed to be connected to a vehicle steering wheel, said steering gear means having an output shaft, steering linkage means supported on said frame component and interconnecting said output shaft of said steering gear means and said wheel support means, hydraulic brake actuating means secured to said frame component, wheel brake means secured to said wheel support means, hydraulic conduit means interconnecting said brake actuating means and said wheel brake means, mounting means secured to said frame component and constructed to connect said subassembly including said frame component, said wheel support means, said suspension means, said steering gear means, said steering linkage means, said hydraulic brake actuating means and said wheel brake means as a unit to the chassis of a motor vehicle.

3,958,654

DEVICE FOR SUSPENDING THE BODY AND MOTOR IN AN AUTOMOBILE VEHICLE

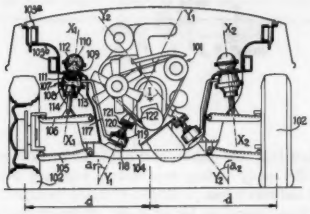
Robert LeSalver, Chanteloup-les-Vignes, and Dominique Poupard, Courbevoie, both of France, assignors to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Boulogne-Billancourt, both of, France

Filed Aug. 4, 1975, Ser. No. 601,469

Claims priority, application France, Aug. 7, 1974, 74.27451

Int. Cl.² B60K *9/00*; B60G *21/00*

U.S. Cl. 180—64 R 8 Claims



1. A suspension device for the body and the motor of an automobile vehicle having at least one set of wheels, comprising two hydraulic shock-absorbers each of which shock-absorber connects a wheel of the set of wheels to the body, each shock-absorber comprising two variable volume chambers, means defining a constricted passage interconnecting the two chambers, one of the chambers having a wall connected to an unsuspended part of the vehicle so that relative displacement of the associated wheel in the upward direction tends to reduce the volume of said one chamber, means for elastically supporting the motor on the body and comprising at least one variable volume enclosure which is filled with an incompressible fluid and a connecting pipe connecting the enclosure to said one chamber.

3,958,655

GAS TURBINE ENGINE FOR VEHICLE PROPULSION

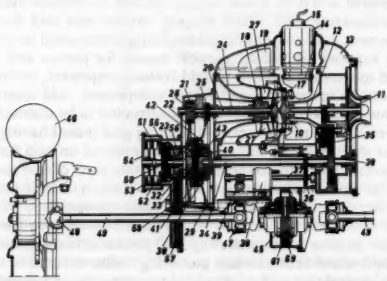
Sven-Olof Kronogård, Lomma, Sweden, assignor to United Turbine AB & Co., Kommanditbolag, Malmo, Sweden

Continuation-in-part of Ser. No. 466,502, May 2, 1974, Pat. No. 3,889,771. This application Apr. 1, 1975, Ser. No. 564,048

Claims priority, application Sweden, May 22, 1973, 7307155

Int. Cl.² B60K *3/04*

U.S. Cl. 180—66 A 3 Claims



1. In a gas turbine engine for driving a pair of wheels at a vehicle and adapted to be mounted adjacent to said wheels and including a rotor unit comprising a compressor and a turbine rotor driving the same, a combustion chamber having fuel burning means and being supplied with air from said compressor, means providing a gas flow path downstream of said combustion chamber, concentric shafts arranged in the gas flow path, said concentric shafts being aligned with the axis of the compressor/turbine rotor unit, first and second power turbine rotors mounted upon said concentric shafts and including a transmission comprising a common housing, a further shaft geared to said turbine rotor shafts within the common housing and adapted to transfer power between the power turbine rotors and the compressor/turbine rotor unit, the improvement including a power take-off shaft from the power turbine rotors coaxially aligned with said transmission shaft, a first planetary gearing, enclosed in a housing and including a sun wheel, a planetary wheel carrier and an enclosing ring wheel mounted upon said power take-off shaft, said sun wheel being carried by said power take-off shaft, upon which said planetary wheel carrier is rotatably mounted and a pinion with which said ring wheel is geared, means provided at said power take-off and at said housing for locking, at will, said planetary wheel carrier to either of said power take-off or said housing, a differential located about midway between said pair of wheels and two pendulum shafts to connect said differential with said vehicle wheels, an external gear wheel for driving the differential, and an external transmission shaft having ends, a gear wheel at each end for cooperation with said ring wheel pinion and said differential external gear wheel, respectively, connecting said first planetary gearing with the differential.

3,958,656

INSTALLATION FOR COMPENSATING FORCES ACTING TRANSVERSELY TO THE DRIVING DIRECTION ON A FAST MOVING VEHICLE

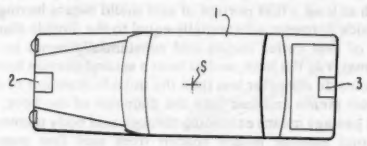
Klaus Niemann, Endersbach, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Sept. 24, 1974, Ser. No. 508,833

Claims priority, application Germany, Sept. 26, 1973, 2348317

Int. Cl.² B62D *5/04*

U.S. Cl. 180—79.1 25 Claims



1. An installation for compensating forces acting on a rapidly moving vehicle with steerable wheels transversely to its driving direction, by a torque applied to a steering wheel, characterized by means for detecting during the drive of the vehicle dynamic measured magnitudes of degrees of freedom as second derivatives with respect to time, information converter means receiving at its input the measured magnitudes and operable to combine with each other said magnitudes and to convert the same into a torque which is transmitted to the steering wheel in by-passing relationship to a servo-steering means and which signals to the driver by its occurrence disturbing forces and thereby causes the driver to apply counterforces, in that the servo-steering means is so constructed that no torque originating at the steerable wheels is transmitted back to the steering wheel, in that said forces acting on the vehicle include transverse acceleration forces and yaw angle forces, in that the torque applied to the steering wheel is formed from a component proportional to the steering wheel deflection, from a component proportional to the transverse acceleration and from a component proportional to the yaw angle acceleration, in that the torque is fromed from components according to the equation

$$M_L = K \cdot \beta_L - p_1 \cdot b - p_2 \cdot l$$

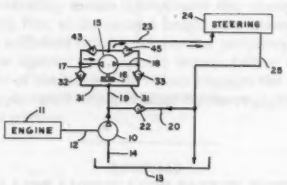
wherein M_L is the torque applied to the steering wheel, b is the transverse acceleration, l is the yaw angle acceleration, β_L is the steering deflection angle at the steering wheel, and K, p_1 and p_2 are proportionality factors for the conversion of the measurement values β_L, b and l, and in that one measuring transmitter means each is arranged in the front area and in the rear area of the vehicle which produce measured values in case of disturbances whose sum is an indication for the transverse acceleration and whose difference is an indication for the yaw angle acceleration.

3,958,657

FLOW COMPENSATING EMERGENCY HYDRAULIC SYSTEM

James R. McBurnett, Corinth, Miss., assignor to Tyrone Hydraulics, Inc., Corinth, Miss.

Filed Apr. 7, 1975, Ser. No. 565,716
Int. Cl.² F15B *20/00*; B62D *5/08*
U.S. Cl. 180—133 **12 Claims**



1. An hydraulic power system for hydraulically operated equipment comprising a first pump, a drive means for operating said first pump, a second pump, drive means for operating said second pump independently of said first pump, fluid passage means interconnecting the first pump with a reservoir, the first pump with the second pump and the second pump with the hydraulically operated equipment, whereby fluid discharged by the first pump is supplied to the second pump, a fluid by-pass around said second pump for conducting fluid supplied by the first pump and not demanded by the second pump to the hydraulically operated equipment, and a supplemental connection between the reservoir and the second pump for supply of fluid to the second pump when its demands are not met by the fluid discharge of said first pump.

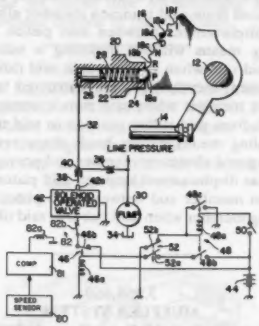
3,958,658

LOCKING DEVICE FOR SHIFT MECHANISM OF AN AUTOMOTIVE POWER TRANSMISSION SYSTEM

Toshiyuki Miyauchi, Yokohama; Wataru Ishimaru, Fujisawa, and Shigeru Milda, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sept. 12, 1974, Ser. No. 505,460
Claims priority, application Japan, Sept. 20, 1973, 48-105473
Int. Cl.² B60R *21/10*
U.S. Cl. 180—82 C **15 Claims**

1. A locking device for locking a shift mechanism of a power transmission system of an automotive vehicle responsive to predetermined manipulative procedure of a vehicle occupant, comprising a cam movable with the shift mechanism and formed with recesses including those corresponding respectively to the neutral and parking positions of the shift mechanism, a catch member in sliding engagement with said cam, resilient biasing means for urging the catch member against the cam, driving means having an operative condition to drive said catch member into locking engagement with said cam through one of the recesses corresponding to the neutral or parking position of the shift mechanism for thereby locking the shift mechanism in the neutral or parking position, said driving means comprising a plunger axially movable in an elongate chamber, and a hydraulic fluid line leading from a source of fluid under pressure to said elongate chamber for directing the fluid under pressure into the elongate chamber and thereby causing the fluid to act on said plunger so that the plunger is axially moved toward said catch member for driving the catch member into one of the recesses corresponding to the neutral and parking positions of the shift mechanism, said



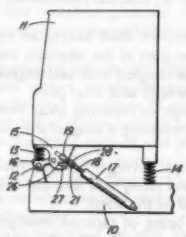
fluid line having a drain port which is made open by said driving means responsive to the completion of said prescribed manipulative procedure of the vehicle occupant when the shift mechanism is in either the neutral position or the parking position, and actuating means responsive to completion of said prescribed manipulative procedure of the vehicle occupant for actuating said driving means into said operative condition when the shift mechanism is in either the neutral position or the parking position.

3,958,659

CAB TILTING MECHANISM FOR TRUCKS

Alan Albert Selman, Southend-on-Sea, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 12, 1974, Ser. No. 460,654
Int. Cl.² B62D *27/04*
U.S. Cl. 180—89 A **3 Claims**



1. A tilt cab truck having a cab, a chassis and pivot means connecting said cab to said chassis,

said cab being angularly displaceable relative to said chassis about said pivot means from a riding position to a tilted position,

a hydraulic ram constructed to exert a force capable of moving said cab from said riding position to said tilted position,

suspension means interposed between said cab and said chassis,

said suspension means resiliently supporting said cab for jounce and rebound vertical displacement relative to said chassis,

said ram having a cylinder portion with one end pivotally connected to one of said chassis and said cab,

said ram having a piston rod portion slidably engaging a coupling means secured to the other of said chassis and said cab,

said coupling means having a trunnion member with a transverse axis and a bearing portion slidably supporting said piston rod,

said piston rod having an abutment member affixed thereto and spaced from said trunnion member allowing relative linear displacement between said piston rod and said coupling means without imposing a substantial force upon said ram when said cab is in said riding position,

said abutment member being constructed to engage said trunnion member when said ram is energized to move said cab from said riding position to said tilted position,

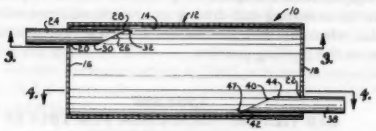
said coupling means having hook shape retaining means engaging said abutment member and preventing substantial linear displacement between said piston rod and said trunnion member and between said piston rod and said coupling member when said cab is in said tilted position.

3,958,660

MUFFLER SYSTEM

Elijah M. Boor, R. R. 2, McCune, Kans. 66753

Filed Jan. 22, 1975, Ser. No. 543,031
Int. Cl.² F01N 1/08
U.S. Cl. 181—57 **10 Claims**



1. A muffler for an internal combustion engine, said muffler comprising:

an elongated hollow shell having an inlet port at one end and an outlet port at the opposite end;

an exhaust pipe coupled with said engine and extending into said shell through said inlet port,

said exhaust pipe terminating away from said one end in a bevel end presenting a longest side and a shortest side of said pipe,

said exhaust pipe having a first slot therein extending from said bevel end along said shortest side in the direction of said one end of the shell,

said first slot being of tapered configuration as it extends toward said one shell end and terminating in a smoothly curved end toward said one shell end,

said exhaust pipe having a second slot therein extending from said bevel end along said longest side in the direction of said one end of the shell, said second slot being greater in length than said first slot and terminating more closely to said one shell end than the end of said shortest side, the ends of said first and second slots toward said one shell end being staggered longitudinally of the pipe; and

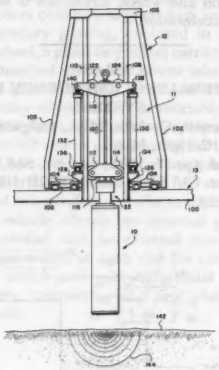
a short finger projection rigid with said exhaust pipe and extending from the longest side thereof toward an imaginary extension of said first slot, said finger projection terminating in a tip that would be located within an imaginary longitudinal extension of said exhaust pipe.

3,958,661

METHOD AND APPARATUS FOR GENERATING SEISMIC WAVES

Clifford D. Dransfield, Dallas, and Phillip W. Wise, Richardson, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sept. 6, 1972, Ser. No. 286,739
Int. Cl.² G01V 1/02
U.S. Cl. 181—117 **22 Claims**



1. A seismic wave generator comprising:

an elongated first tube, enclosed at top and bottom;

a piston disposed within said first tube;

a piston rod having a hole along its interior length for exhausting combustion gases, upon which said piston is carried, extending through a hole in the top of said first tube;

a second tube carried by said piston coaxially with said first tube to define a combustion chamber therewithin, said second tube being of a substantial length relative to said first tube;

means on the opposite side of said piston from said combustion zone for containing a gas under pressure to bias said piston toward said combustion chamber;

a fuel conducting tube extending within said piston rod to approximately the middle of said combustion chamber;

the ratio of the diameter to the distance said piston travels being one to at least three;

whereby said generator can be operated with or without initial ground surface contact and when a combustion fuel is introduced within the combustion chamber through said fuel conducting tube and ignited, a force is applied to said piston in one direction and a force is applied to said first tube in an opposite direction, thereby absorbing said force applied to said piston without the use of a special mechanical reaction mass and generating seismic waves when said first tube impacts a ground surface.

3,958,662

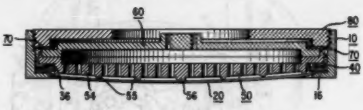
TENSIONED DIAPHRAGM MOUNTING FOR AN ELECTROACOUSTIC TRANSDUCER

Alex Michael Brzezinski, and Joe Edward Warren, both of Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 18, 1975, Ser. No. 550,534
Int. Cl.² H04R 7/24, 19/00
U.S. Cl. 181—171 **14 Claims**

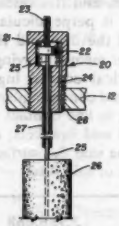
1. An electroacoustic transducer comprising:

a diaphragm;
means for supporting the periphery of the diaphragm;
means including compressible means for clamping the periphery of the diaphragm against the support means, the clamping means having a first height prior to compression and a second height after compression is completed; and
tensioning means having a perimeter portion for compressing the clamping means from its first to its second height and a central portion for engaging the diaphragm, the central portion having a height that is less than the first



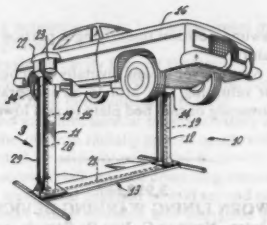
height of the clamping means and greater than the second height of the clamping means, the difference between the height of the central portion of the tensioning means and the first height of the clamping means being such that as the tensioning means compresses the clamping means from its first to its second height, the clamping means exerts sufficient force to clamp the periphery of the diaphragm against the support means before the central portion of the tensioning means engages the diaphragm, the diaphragm being tensioned by the engagement of the central portion.

3,958,663
AIR LINE LUBRICATOR SAFETY DEVICE
Robert M. Moore, 4695 S. Jason St., Englewood, Colo. 80110
Filed Jan. 15, 1975, Ser. No. 541,200
Int. Cl.[2] F16N *7/30*
U.S. Cl. 184—6.4 **7 Claims**



1. An air line lubricator safety device for automatically actuating an air actuatable member such as a tool cut-off valve or a signaling device located outside of the lubricator comprising
a. a lubricator having a head which includes means for feeding pressurized air into the lubricator, said lubricator having an oil bowl containing oil and pressurized air and means for feeding the oil to a line leading to an air operated tool,
b. a piston housing having a piston chamber mounted on the head of the lubricator,
c. a piston slidable in said piston chamber,
d. an air outlet tube communicating with said piston chamber and leading to an air actuatable member located outside of the lubricator,
e. a float supported by the oil in the lubricator bowl to rise and fall with the level of said oil,
f. means connecting the float to the piston to cause the piston to move to a position closing said air outlet tube when the oil supports the float above a predetermined level and to expose the opening in said air outlet tube when the oil supports the float below a predetermined level, and
g. an air intake passageway in the piston housing communicating with the pressurized air in the lubricator bowl and with the piston chamber and delivering pressurized air to the piston chamber between the face of the piston and end of the piston chamber in communication with the air outlet tube, thereby permitting pressurized air to flow through the air outlet tube for actuating an actuable member located outside of the lubricator.

3,958,664
FAIL SAFE MECHANISM FOR AUTOMATICALLY DE-ENERGIZING A MULTI-POST VEHICLE HOIST
William V. Perkins, Monrovia, Calif., assignor to Maxon Industries, Inc., Huntington Park, Calif.
Filed Oct. 25, 1974, Ser. No. 518,100
Int. Cl.[2] B66F *7/14*
U.S. Cl. 187—8.47 **8 Claims**



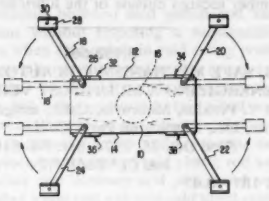
1. A load lifting and lowering hoist comprising:
a vertically extending framework having a load bearing means vertically moveably mounted thereon;
a power means coupled to said load bearing means for raising and lowering said means, and including a linear element;
a control means to activate said power means for raising or lowering said load bearing means by movement of a control arm having a neutral, off position in which said power means is de-energized, said control arm comprising a rotary element, said control means including a parallel pair of link members pivotally connected at one end to diametrically opposite extremities of said control arm, in parallel;
a striker means having a lost-motion connection to said control arm, said striker means having a normally retracted position beyond the range of movement of said control arm, said striker means comprising a bar mounted in opposition to the other ends of said pair of links;
normally inactive means which, upon release, moves said striker means into an extended position against said other ends of said link members to hold said control arm in said neutral, off position; and
means responsive to breakage of said linear element to release said normally inactive means to effect movement of said striker means to said extended position.

3,958,665
AUTOMOTIVE LIFT WITH AUTOMATICALLY RETURNING FRAME-ENGAGING ARMS
Arnold H. Troxell, 1230 Midway Road, Whitehall, Pa. 18052
Filed June 18, 1975, Ser. No. 588,044
Int. Cl.[2] B60S *13/00*; **B66F** *7/00*
U.S. Cl. 187—8.75 **10 Claims**

1. A lift device for automative vehicles, comprising in combination:
a bed plate vertically movable between a lowered position relative to a support surface in which a vehicle may strad-

dle it with clearance and an elevated position in which a vehicle likewise is elevated;

at least one horizontally swingable arm pivotally attached to said bed plate and movable from an inoperative position allowing a vehicle to straddle the bed plate and an outwardly swung position underlying a portion of a vehicle frame; and



automatic return lever means pivotally attached to said bed plate for returning said arm to an inoperative position during lowering of said bed plate to said lowered position thereof.

3,958,666

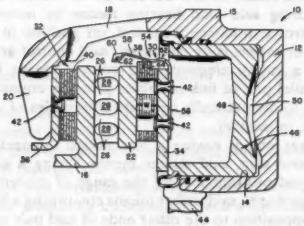
WORN LINING WARNING DEVICE

Robert L. Hooten; Norman C. Van De Somple, and George L. Koloszar, all of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Nov. 11, 1974, Ser. No. 522,565

Int. Cl.² F16D *66/02*; G08B *03/00*

U.S. Cl. 188—1 A **17 Claims**



1. In a disc brake including a caliper housing a rotor rotatable about an axis having a pair of opposed friction faces, the periphery of said rotor between said faces having solid portions and open portions between said solid portions a pair of friction elements including friction material for engagement with said friction faces, and means for urging said friction elements into braking engagement with said friction faces when a brake application is effected, wherein the invention comprises resilient means carried by the caliper housing responsive to wear of the friction material of one of said friction elements, said wear responsive means including means normally held away from said periphery of the rotor but moving to engage said periphery of the rotor when the friction elements have worn to a predetermined thickness, whereby engagement of the wear responsive means with the solid portions and the open portions generates a pulsating noise upon rotation of said rotor.

3,958,667

DISC-BRAKES, ESPECIALLY FOR AUTOMOBILE VEHICLES

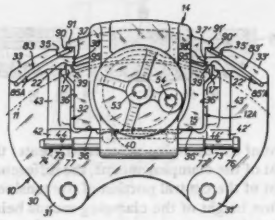
Marie Alfred Gerard de Gennes, Senlis, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Feb. 15, 1974, Ser. No. 442,898

Claims priority, application France, Feb. 21, 1973, 73.06074; Nov. 16, 1973, 73.40830

Int. Cl.² F16D *55/224*, *65/02*

U.S. Cl. 188—73.3 **36 Claims**



1. A disc brake comprising a fixed support, a disc rotatably mounted with a shaft to be braked, a major part of the fixed support being substantially parallel to said disc, a brakeshoe disposed on each side of said disc for movement perpendicular to the plane of said disc, a transfer member mounted on said fixed support for movement perpendicular to the plane of the disc, a hydraulic operating unit acting directly on a first of said brakeshoes and indirectly on a second of said brakeshoes through said transfer member, resilient means for urging said transfer member into contact with retaining stop means, two brackets fixed to said major part of said fixed support and projecting outwardly from the side of said major part remote from said disc, each bracket having a flat surface perpendicular to said disc and to said major part and defining one of said retaining stop means, said flat surfaces being disposed in a common plane that is perpendicular to a radial plane that includes the axis of the disc and that bisects said transfer member, said transfer member having two laterally projecting substantially cylindrical coaxial lugs the common axis of which is parallel to said common plane and to the plane of the disc, said lugs being in line contact with and movable along said flat surfaces of said brackets, and each said lug being disposed between the said flat surface of the associated said bracket and the axis of said disc.

3,958,668

CLOSED LOOP TYPE DISC BRAKE

William J. Kestermeier, and James J. Colpaert, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Dec. 23, 1974, Ser. No. 535,938

Int. Cl.² F16D *55/228*

U.S. Cl. 188—73.4 **4 Claims**

1. In a disc brake:

a rotor having a pair of friction faces;

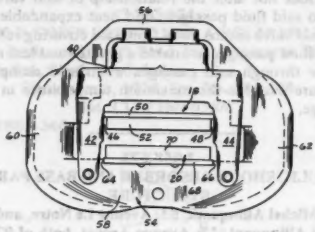
a pair of friction elements, one of said friction elements being disposed adjacent each of said friction faces and adapted to engage the latter when a brake application is effected;

a fixed support mounted adjacent said rotor;

a caliper slidably mounted on said fixed support for urging said friction elements into braking engagement with said friction faces when a brake application is effected;

said caliper including a fluid motor portion disposed adjacent one of said friction elements, said fluid motor portion including a pair of circumferentially spaced arms projecting across the periphery of said rotor, said arms being integral with said fluid motor portion, said caliper further including a collar having a section embracing the

other friction element and traversing sections extending from opposite ends of said embracing section, said traversing sections extending across the periphery of said rotor generally parallel to corresponding arms, and means rigidly fastening each of said arms to said embracing section of the collar so that said fluid motor portion and said collar move as a unit;



each of said arms having an edge facing the corresponding edge of the other arm, the facing edges of said arms defining a recess therebetween, said one friction element being located in said recess, said facing edges defining torque-receiving abutment surfaces, said one friction element transmitting braking torque to a corresponding one of said torque-receiving abutment surfaces when a brake application is effected.

3,958,669
RESILIENTLY SUPPORTED MAGNETIC RAIL-BRAKE SUSPENSION DEVICE

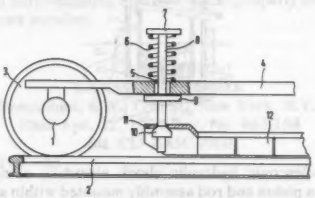
Lothar Schmied, Wetter, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

Filed Dec. 20, 1974, Ser. No. 534,810

Claims priority, application Germany, Sept. 13, 1974, 2443832

Int. Cl.² B60L *7/00*; B61C *15/04*; F16F *1/06, 1/26*

U.S. Cl. 188—165 **5 Claims**



1. A device for suspending a rail-brake magnet from a structure on a railway vehicle at a predetermined distance above a rail when in its de-energized state, said structure having a vertical opening therein, and comprising a compression spring and having a lower end surrounding said opening and an upper end, a plate on the upper end of said spring, means for connecting said spring to a rail-brake magnet and comprising a rod having an upper end connected to said plate and passing within said spring through said opening and having a lower end, a bearing block on the lower end of said connecting rod having a spherical bearing surface on the top thereof and engaging the underside of the rail brake magnet to pivotally support the rail brake magnet, and abutment means for limiting the movement of said spring in the direction of raising said rail-brake magnet to its de-energized position such that said spring is subjected to an initial stress when the rail-brake magnet is raised to its de-energized position, and an adjustable threaded coupling between said rod and one of said plate and said bearing block.

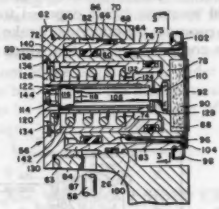
3,958,670
BRAKE ACTUATING APPARATUS INCLUDING PISTON AND ADJUST/RESET MEANS

Bruce W. Anderson, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed June 30, 1975, Ser. No. 591,541

Int. Cl.² F16D *65/54*

U.S. Cl. 188—196 R **10 Claims**



1. A brake actuating piston and adjust/reset means housed therein comprising:

a casing having a cavity formed therein;

a piston slidably carried in said cavity and responsive to a pessurized fluid communicated thereto;

first, second and third tubular means coaxially arranged one within the other in radially spaced apart relationship and surrounded by said piston coaxial therewith;

first and second axially spaced apart stop means on said first tubular means and engaged by said second tubular means to establish brake released and energized positions, respectively;

resilient means operatively connected to said first and second tubular means for urging said second tubular means axially into engagement with said first stop means;

stem means secured at one end to said piston and extending therefrom axially through said third tubular means; and

annular means secured to the free end of said stem and engageable with said third tubular means;

said piston being slidably carried on said first tubular means and urged by said pressurized fluid against the resistance of said resilient means during a brake application thereby causing said second tubular means to engage said second stop means whereupon said third tubular means is fixed in position and said annular means is forcibly urged axially therethrough in response to a predetermined force derived from said piston to thereby deform said third tubular means radially outwardly and allow said piston to advance relative to said first tubular means accordingly to compensate for wear of said brake;

said brake being released in response to depressurization of said piston whereupon said piston is retracted in response to said resilient means urging said second tubular means into engagement with said first stop means to establish a predetermined brake running clearance.

3,958,671
HYDRODYNAMIC BRAKE SYSTEM

Helmut Muller, Heidenheim (Brenz), Germany, assignor to Voith Getriebe KG, Heidenheim (Brenz), Germany

Filed Dec. 5, 1974, Ser. No. 530,041

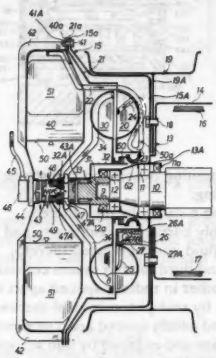
Claims priority, application Germany, Dec. 8, 1973, 2361351

Int. Cl.² F16F *9/42*; F16D *57/04, 65/78*

U.S. Cl. 188—274 **17 Claims**

1. The combination of a rotary member, particularly an idler wheel for use on vehicles, with a hydrodynamic brake system comprising a stator coaxial with said rotary member; a rotor coaxial with said stator and defining therewith a toroidal working chamber; a reservoir forming a substantially closed pressure vessel coaxial with said rotor; means for fas-

tening said reservoir and said rotor to said rotary member for rotation therewith, said reservoir being partially filled with brake fluid so that the latter forms an annulus having a substantially cylindrical internal surface in response to rotation of said rotary member at a speed exceeding a predetermined value; conduit means connecting said chamber with said reservoir to define a closed path for circulation of brake fluid from said reservoir into said chamber and back into said reservoir whereby the fluid is heated while flowing through said chamber when said rotor rotates relative to said stator, at least a portion of said reservoir being exposed to the surrounding atmosphere to promote the cooling of brake fluid therein, said conduit means comprising a conduit which feeds brake fluid



to said chamber and has an intake end communicating with said reservoir radially outwardly of said internal surface and a discharge end in the interior of said rotor, and at least one evacuating surface which admits brake fluid from said chamber to said reservoir, said evacuating conduit having an intake end facing said rotor and communicating with that portion of said chamber which is remotest from the axis of said rotor, and a discharge end; means for admitting into said reservoir a compressed gas to thereby initiate the circulation of brake fluid along said path; and normally closed check valve means disposed between said discharge end of said evacuating conduit and said reservoir and arranged to open in response to a predetermined fluid pressure in said chamber.

3,958,672

SHOCK ABSORBER VALVE CONSTRUCTION

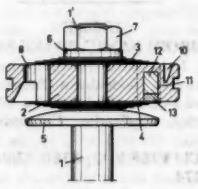
Friedrich Keilholz, Ennepetal, Germany, assignor to Firma August Bilstein, Ennepetal, Germany

Filed Aug. 8, 1974, Ser. No. 495,549

Claims priority, application Germany, Aug. 14, 1973, 2340987

Int. Cl.² F16F 9/52

U.S. Cl. 188—277 **6 Claims**



1. A hydropneumatic shock absorber for a motor vehicle or the like, comprising a damping piston movable within a tube containing damping fluid, said piston having fluid passages therethrough and spring-loaded valve means at least partially covering and restricting the fluid flow through said passages, at least one heat expandable element disposed in a pocket formed in said piston; said heat expandable element being in thermal contact with said damping fluid and arranged in such manner relative to said valve means, that during normal operation of said shock absorber with said damping fluid at a temperature within a desired range, said heat expandable element does not alter the relationship of said valve means relative to said fluid passages; said heat expandable element moving said valve means away from said covering relationship with said fluid passages to enable a greater and less restricted fluid flow through said passages when said damping fluid temperature exceeds the maximum temperature in said desired range.

3,958,673

HYDRAULIC SHOCK ABSORBER AND BASE PARTITION STRUCTURE

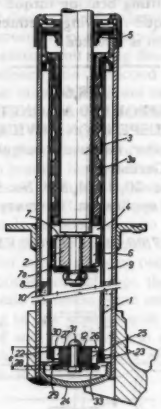
Fernand Michel Allinquant, 53, Avenue Le Notre, and Jacques Gabriel Allinquant, 12, Avenue Arouet, both of 92-Sceaux, France

Continuation of Ser. No. 414,516, Nov. 9, 1973, abandoned. This application Apr. 15, 1975, Ser. No. 568,327

Claims priority, application France, Nov. 9, 1972, 72.39782; Aug. 31, 1973, 73.31583

Int. Cl.² F16F 9/348

U.S. Cl. 188—322 **2 Claims**



1. A telescopic hydraulic shock absorber, comprising a cylinder, a piston and rod assembly mounted within said cylinder for movement in response to damped oscillations, a reservoir chamber in communication with one end of said cylinder, a transverse partition extending across said one end of said cylinder separating the interior of said cylinder from said reservoir chamber, said partition being of sufficient thickness to include a portion thereof extending beyond said end of said cylinder into said reservoir chamber;

two first valve-controlled passages provided within said partition for the flow of liquid from said reservoir chamber to the interior of said cylinder, said passages having in section the shape of two opposite ring segments centered on the partition and subtending opposite angles (β), said partition being peripherally recessed on said portion extending into said reservoir chamber and along the same angles (β) so as to form opposite lateral convergent inlets for said passages; and

two second valve-controlled passages provided within said partition between said first passages permitting the flow of liquid from the interior of said cylinder to said reservoir chamber, said second passages having in section the

shape of two opposite ring segments centered on said partition and subtending opposite angles (β) smaller than said angles (β), said partition being peripherally recessed on said portion extending into said cylinder and along the same angles (α) so as to form opposite lateral convergent inlets for said second passages.

3,958,674

HOLD-DOWN DEVICE FOR A DRUM BRAKE

Donald F. Borkowski, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed June 6, 1975, Ser. No. 584,308
Int. Cl.² F16D *65/08*
U.S. Cl. 188—340 **6 Claims**

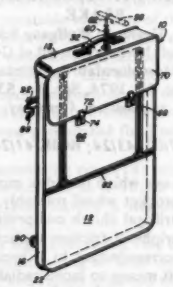
1. In a brake: a rotating drum, a stationary support member mounted adjacent said drum, a pair of brake shoes slidable on said support member and movable toward and away from frictional engagement with said drum, means for urging said brake shoes into frictional engagement with said drum when a brake application is effected, first resilient means yieldably urging said brake shoes away from said drum, second resilient means interconnecting said brake shoes and said support member to yieldably mount said brake shoes on said support member, said second resilient means including an anchor portion adapted for connection to said support member and a linking portion connecting with a corresponding brake shoe, said linking portion being joined with said anchor portion, and a detent carried by said corresponding brake shoe for preventing connection of the anchor portion and the linking portion by holding said linking portion away from said anchor portion when said corresponding brake shoe is improperly installed on said support member.

3,958,675

GARMENT CARRIER

Julia R. Rosenblum, 6 W. 77th St., New York, N.Y. 10024

Filed Apr. 22, 1974, Ser. No. 463,158
Int. Cl.² A45C *7/00*
U.S. Cl. 190—43 **5 Claims**



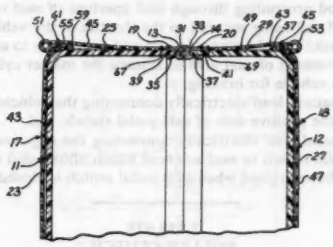
1. A garment carrier comprising a vertically elongated flexible bag including front and rear panels connected by a peripheral wall with the bag being generally rectangular in configuration, handle means attached to the upper end of the garment carrier, the front panel including a closure means openable to enable easy access to the interior of the garment carrier, the top of said garment carrier including a rigid support bar having means thereon for receiving and supporting a plurality of garment hangers, and means at the upper end of the front panel forming a flexible flap, said means forming the flap including a flexible panel having a free lower edge, fastening means adjacent to the lower edge of the flap, said panel overlying and concealing the upper end of the closure means when the garment bag is in unfolded condition and keeper means spaced upwardly from the bottom of the rear panel, said fastening means on the flap being connectable with said keeper means for retaining the garment bag in folded condition with the bottom of the bag disposed under the flap adjacent the top of the bag whereby the handle means enables the garment carrier to be handled in the nature of a suitcase or similar hand luggage.

3,958,676

LUGGAGE CASE WITH SOFT SIDED EXTERIOR

Joseph Eugene March, Chicago, Ill., assignor to Platt Luggage, Inc., Chicago, Ill.

Filed Jan. 20, 1975, Ser. No. 542,180
Int. Cl.² A45C *13/30, 3/00*
U.S. Cl. 190—49 **8 Claims**



1. A luggage case comprising two opposed concave inner shells of structural material, each defining a recess and having a peripheral edge surrounding said recess, means pivotally mounting said shells for movement between a closed position in which said shells define a closed volume to an open position in which said recesses defined by said shells are exposed, and two outer coverings of flexible material, each defining a recess having a peripheral edge surrounding said recess, each of said inner shells being substantially covered by a respective one of said outer coverings and the facing sides thereof being substantially unattached throughout large areas to allow said outer coverings to flex relative to said inner shells; means fixedly securing each of said two outer coverings in a non-detachable manner proximate the peripheries of said inner shells and said outer coverings leaving said substantially unattached large areas, and valence means joined to said inner shells about their peripheral edges for cooperative engagement when the luggage case is closed.

3,958,677

UNITARY PEDAL APPARATUS FOR SELECTIVELY ACCELERATING AND BRAKING A VEHICLE

Evangelos L. Spanelis, 116½ S. Main St., Yardley, Pa. 19067

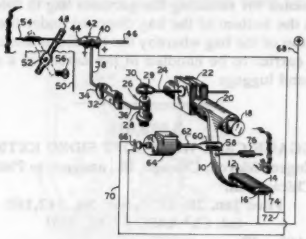
Filed Sept. 18, 1974, Ser. No. 505,401
Int. Cl.² F16D *67/00*
U.S. Cl. 192—3 R **10 Claims**

1. A unitary pedal apparatus for selectively accelerating and braking a vehicle comprising:

a. a pedal;

b. a normally closed pedal switch, being integral with said pedal and responsive to open upon the application of slight pressure on said pedal;

c. a pedal arm with said pedal affixed to one end thereof;
d. a shaft with the other end of said pedal arm affixed thereto;
e. a lever secured to said shaft;
f. an expandable mechanical linkage element attached to said lever to absorb any overstressing of the mechanical linkage;
g. a crank bar connected to said expandable element;
h. a solenoid fixedly attached to said crank bar, said solenoid including a one-way clutching means, said solenoid having a longitudinal aperture therethrough;



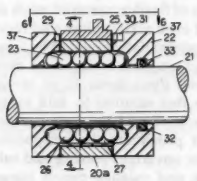
i. a rod protruding through said aperture of said solenoid, said rod being secured to the throttle of the vehicle;
j. a brake bar abutting said arm and responsive to sufficient movement of said arm to actuate the master cylinder of the vehicle for braking;
k. a battery lead electrically connecting the vehicle battery to the positive side of said pedal switch; and
l. a pedal lead electrically connecting the negative side of pedal switch to said solenoid which allows said solenoid to be energized when said pedal switch is closed.

3,958,678

ROLLER CLUTCH

John Doise Jeter, Dallas, Tex., assignor to Texas Dynamatics, Inc., Dallas, Tex.

Filed Apr. 1, 1974, Ser. No. 456,623
Int. Cl.[2] F16D *41/08*; F16C *19/08*
U.S. Cl. 192—44 **15 Claims**



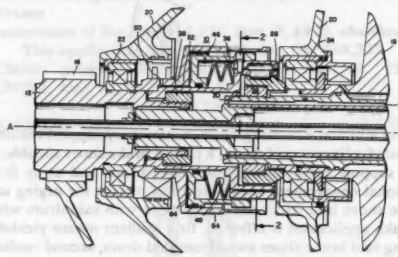
1. A clutch for transmitting torque to a first member having a smooth cylindrical outer surface while allowing axial movement of the member relative to the clutch comprising a housing having an opening through which the first member extends, with its cylindrical outer surface adjacent the side wall of the opening, a plurality of elongated channels of finite length in the side wall of the opening having a longitudinal direction extending in the direction of the longitudinal axis of the member, means to communicate rollers between opposite ends of the channels so that rollers may be endlessly circulated along said channels, a plurality of rollers filling the channels and circulating means so that movement of the rollers in contact with the surface of the member along the channels induces a generally sympathetic movement in all the rollers, a surface of said channel having a contour which allows rollers to move along the surface of the member in contact with the surface of said member and the surface of said channel in a direction of the axis of the member, the transverse contour of the surface of the channels shaped to pinch the rollers against the member if the rollers move in at least one peripheral direction about the member relative to the channel to cause a load vector through the pinched roller to have a peripheral component to resist rotation of the member relative to the housing while allowing the rollers to move longitudinally along the channel with reasonable freedom to permit axial movement of the member relative to the housing.

3,958,679

DECOUPLER

Carl A. Tamarin, Scottsdale, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Nov. 4, 1974, Ser. No. 520,826
Int. Cl.[2] F16D *3/34*
U.S. Cl. 192—45 **15 Claims**



1. A coupling device for selectively coupling a rotating driving shaft to a driven shaft, said coupling device comprising:
a first ring member attached to said driving shaft and rotatable therewith;
a second ring member concentric with said first ring member and attached to said driven shaft and rotatable therewith;
a plurality of connector members for selectively connecting said first ring to said second ring for coupling said driving shaft to said driven shaft;
actuating means for selectively disengaging said connector members from said second ring member, and
means for retaining said connector means in disengagement until rotation of said first ring is substantially stopped.

3,958,680

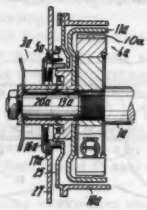
MOTOR CHAIN SAW WITH PLURAL CLUTCHES AND A BRAKE

Herbert Armbruster, Hegnach; Wolfgang Schilling, Kirchberg, and Dieter Wieland, Neckarrems, all of Germany, assignors to Andreas Stihl Maschinenfabrik, Neustadt, Germany

Filed Dec. 23, 1974, Ser. No. 535,976
Claims priority, application Germany, Dec. 22, 1973, 2364288
Int. Cl.[2] F16D *47/02, 43/24*; B60K *41/24*; B23D *59/00*
U.S. Cl. 192—48.5 **16 Claims**

1. A motor chain saw which includes: motor operable shaft means, a driving sprocket wheel rotatably mounted on said shaft means, a centrifugal clutch comprising a central body having an outer peripheral friction surface responsive to a centrifugal force corresponding to a preselected speed of rotation of said shaft means to move radially outwardly, said central body being fixed to said shaft means in axially spaced relationship to said driving sprocket wheel, said centrifugal clutch also comprising a clutch drum having a hub rotatably mounted on said shaft means and also having an outer peripheral cylindrical surface extending over said outer peripheral

friction surface for frictional cooperation therewith at said preselected speed of rotation of said shaft means, and a safety clutch having two clutch elements, one of said two clutch elements being formed by the hub of said clutch drum and the



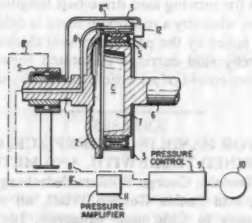
other one of said two clutch elements being formed by the hub of said sprocket wheel, said safety clutch being located on that side of said centrifugal clutch which faces toward said sprocket wheel and being interposed in the driving connection between said centrifugal clutch and said sprocket wheel.

3,958,681

MEANS OF SUPPLYING CONTROL AIR TO AN INFLATABLE MEMBER OF A TORQUE CONTROL MEANS

Eisuke Sugahara, Tokyo; Shigeo Uehara, Kawaguchi; Yoshihiro Sugizaki, Urawa, and Yasuo Uchida, Tokyo, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1974, Ser. No. 522,174
Claims priority, application Japan, Nov. 8, 1973, 48-124983
Int. Cl.² F16D *25/04*
U.S. Cl. 192—88 B **3 Claims**



1. In a device for selectively transmitting torque between first and second rotatable members of the type having a drum carried by said first rotatable member, a friction shoe carried by an inflatable member attached to a housing fixed to the second rotatable member, said friction shoe being engagable with said drum upon inflation of said inflatable member by a pressurized fluid and a controllable source of pressurized fluid, the improved pressurized fluid supply system comprising:

a. a signal transmitting ring (**14**) attached to said second rotatable member so as to rotate therewith, said signal transmitting ring having a transmitting air bore (**13**) therethrough;

b. a stationary signal receiving ring (**19**) surrounding said signal transmitting ring so as to define a space therebetween (**17**), and rigidly attached to a stationary support, said signal receiving ring having signal air receiving bore (**18**) therethrough communicating with said space;

c. deviation detection means (**12**) to detect the relative circumferential shifting between the housing and the friction shoe when said shoe is engaged with said drum, and to control the pressure of the fluid within said inflatable member in direct proportion to the amount of deviation detected, said detection means having an inlet port (**25**) and an outlet port (**41**);

d. first conduit means (**8**) connecting said controllable source of pressurized fluid to said deviation detection means inlet port (**25**) and said inflatable member (**14**);

e. second conduit means (**8''**) connecting said deviation detection means outlet port (**41**) with said signal transmitting ring transmitting air bore (**13**); and

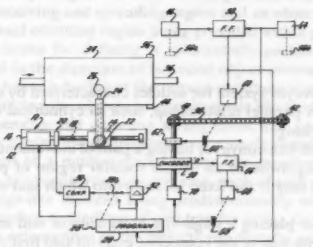
f. third conduit means (**8'**) connecting said signal air receiving bore (**18**) with said controllable source of pressurized fluid.

3,958,682

COORDINATION OF ROBOT AND CONVEYOR

Paul S. Martin, 189-54 43rd Road, Flushing, N.Y. 11358

Continuation of Ser. No. 412,532, Nov. 5, 1973, abandoned. This application June 9, 1975, Ser. No. 585,107
Int. Cl.² B23Q *7/03*
U.S. Cl. 198—19 **18 Claims**

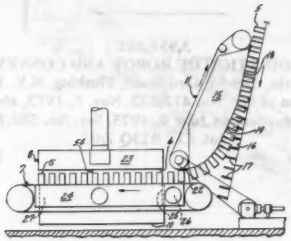


1. In combination, an industrial robot having a work head operable through a range of positions and having control means programmed for causing the work head to perform an automatic program of operations and three-dimensional motions relative to a work-piece at rest, a conveyor including a work carrier for transporting the work-piece along a path in the operative range of the work head, the work-piece and its work carrier forming a work unit, and means for modifying the control of the work head by the programmed control means in accordance with the travel of the work unit, said modifying means including means for providing corrective output having a starting condition, and means for operating said corrective output means out of said starting condition in synchronism with the travel of the work unit, said operating means including an endless chain, means for supporting said chain and for disposing a length thereof for movement along a chain-advance path adjacent and parallel to said path of the work carrier, said chain-supporting means including at least one sprocket and said chain being operable endlessly in one direction about said sprocket, transmission means for providing drive of said corrective output means by said sprocket, locking means for coupling said chain to said work unit to be driven thereby and for operating said corrective output means throughout the automatic program of the work head and for thereafter releasing the chain from the work unit, and means for restoring said corrective output means to its starting condition after completion of said automatic program while said chain is operated at any rate including zero in said one direction.

3,958,683
CONVEYOR SYSTEM INCLUDING ARTICLE REGROUPING APPARATUS

Alex J. Schregenberger, Neshanic, N.J., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Sept. 27, 1974, Ser. No. 510,049
Int. Cl.² B65G 47/00
U.S. Cl. 198—22 R 8 Claims



1. A conveyor system for articles characterized by opposite flat ends in parallel relationship, such as cylindrical containers, comprising:

a first belt-like conveyor having a path of movement extending lengthwise of an article transfer region of predetermined length and fixed location into which said conveyor faces;

means for placing a single-file succession of said articles to rest with one of the respective ends on said first conveyor outside said transfer region to pass in a procession therethrough;

a second relatively wide belt-like conveyor having a path of movement extending transversely away from the path of movement of said first conveyor, and having an article-receiving end portion in spaced laterally opposite relation with that portion of said first conveyor in said transfer region;

an elongate transfer conveyor having an article pickup area of length substantially equal to that of said transfer region;

reciprocating means for supporting and cyclically moving the transfer conveyor comprising means for guiding the transfer conveyor along a planate napiform path from a position in said transfer region wherein said pickup area faces said first conveyor in generally parallel relation therewith, and said area is spaced perpendicularly to the first conveyor at a desired spacing slightly greater than the dimension of said articles between said flat sides to a position spacing said area over said article-receiving end portion of the second conveyor at approximately said desired spacing;

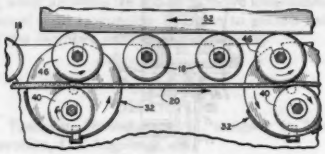
said transfer conveyor comprising article attracting means operable to lift articles from a section of said first conveyor in said transfer region and to adhere them by respective flat ends to said pickup area, and thereafter to release them to said second conveyor by depositing the articles with the opposite of said ends on the second conveyor;

control means controlling said attracting means to attract articles while in said transfer region and to release the attracted articles from said area while in said position over said article-receiving section.

3,958,684
ACCUMULATING CONVEYOR

Thomas L. Garzelloni, Spring Lake, Mich., assignor to A W & H Manufacturing Co., Inc., Worth, Ill.

Filed Aug. 7, 1974, Ser. No. 495,303
Int. Cl.² B65G 13/02
U.S. Cl. 198—127 R 10 Claims



1. An improved accumulating conveyor comprising:

a frame having a pair of parallel side members;

a plurality of roller carriages rotatably mounted transversely on said frame between said side members, said roller carriages each comprising a pair of spaced end portions and a connecting portion connecting said end portions;

a pressure roller rotatably mounted on a lower portion of each roller carriage between said end protions;

a conveyor roller rotatably mounted between said end portions in an upper portion of each roller carriage parallel to and spaced from said pressure roller;

means for mounting said roller carriages between said side members for rotation about an axis between the axes of rotation of said pressure and conveyor rollers;

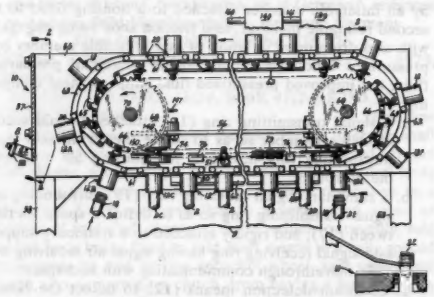
an endless drive belt mounted on said frame and positioned to pass between said pressure rollers and said conveyor rollers, said belt having a thickness less than the distance between said conveyor roller and said pressure roller, and said belt having a thickened portion having a thickness at least equal to the distance between said pressure roller and said conveyor roller; and

drive means for moving said drive belt longitudinally along said frame, whereby a rotational force is delivered to said conveyor roller by the passage of said thickened portion, and whereby said carriage is rotated forwardly by the forward movement of an article carried by said conveyor roller.

3,958,685
COUPLING FOR HANDLING WORKPIECE, CONVEYOR COMBINED THEREWITH, AND METHOD

David Ian McDonald; George William Sederberg; Gary David Stephenson, and James Gordon Wiatt, all of Cincinnati, Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed June 3, 1974, Ser. No. 475,620
Int. Cl.² B65G 15/00
U.S. Cl. 198—179 22 Claims



1. A machine for carrying a workpiece between a workpiece

loading station and a workpiece unloading station and return comprising the combination of:

a. a machine base;

b. a coupling capable of engaging and disengaging a shaped portion of a workpiece responsive to being moved to and from respectively said workpiece loading station and said workpiece unloading station;

c. conveyor means movably mounted relative to said machine base for supporting said coupling for repeated movement along respective first and second paths to and away from said respective stations for loading and unloading;

d. means for operating said coupling to engage and disengage said workpiece responsive to said coupling arriving at said loading station and at said unloading station, respectively;

e. means for feeding workpieces one at a time into said coupling when said coupling arrives at said loading station;

f. conveyor drive means that alternately and periodically interrupts movement of said conveyor between said stations to alternately stop said conveyor with said coupling arrived at said means for feeding to receive a workpiece therefrom and then to advance said conveyor a predetermined amount; and

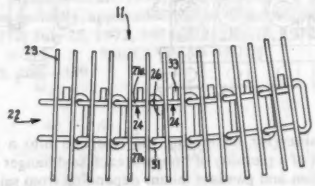
g. timing system means for operating said feeding means to feed a workpiece into said coupling when said conveyor movement is interrupted connected between said means for feeding and said conveyor drive means.

3,958,686

CONVEYOR CONSTRUCTION

Robert C. Bradford, 908 Cram Lane, Albion, Mich. 49224

Filed Sept. 23, 1974, Ser. No. 508,181
Int. Cl.² B65G *17/06*
U.S. Cl. 198—189 **9 Claims**



1. In a conveyor system, the combination comprising:

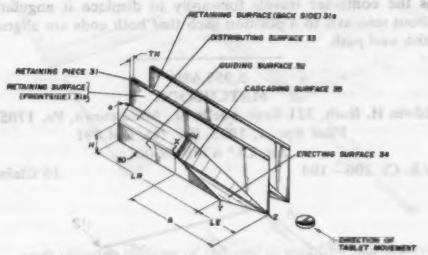
an elongated endless conveyor chain having load-supporting members thereon, said chain comprising a series of interconnected links, each link being substantially U-shaped in plan view and being made of one-piece rod stock bent to form a transversely extending bight and a pair of substantially parallel, transversely spaced-apart legs extending from the opposite ends of the bight in the same direction longitudinally of the chain, each of said legs comprising an upper intermediate portion connected at one end thereof to said bight and a reversely curved end portion extending downwardly from the other end of said upper intermediate portion and thence extending lengthwise of said upper intermediate portion partway to said bight and being disposed directly under said upper intermediate portion, the reversely curved end portions of said legs defining a slot through which extends the bight of the adjacent link, whereby the links are connected together for relative hinging movement in sideward and vertical directions, the inner end of the reversely curved portion of at least one of said legs being defined by an outwardly turned transverse ear that projects sidewardly from the chain and extends sidewardly beyond the corresponding end of the bight for engagement with a guide or driving device.

3,958,687

HIGH-SPEED MULTI-CHANNEL FEEDER FOR TABLETS

Jim Mills Adams, West Caldwell, and Gilbert Carl Kaetzel, Wayne, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 9, 1974, Ser. No. 513,353
Int. Cl.² B65G *27/04, 47/12*
U.S. Cl. 198—220 BA **61 Claims**



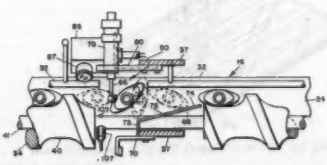
1. Apparatus for feeding at high speed, random flowing discreet solid particular objects such as tablets to a high-speed sensing and counting arrangement under the influence of gravity comprising an inclined vibrating feeder tray having an object receiving and spreading region and an object orienting region, said orienting region being provided with a plurality of spaced means for defining N substantially parallel channels arranged in the direction of intended object movement, each of said channels having at the remote end thereof an exit port for permitting the objects to pass in single file from said tray to the sensing and counting arrangement and each of said channels having associated therewith a single directing means comprised of a multi-surfaced wedge-like member having a plurality of unique orienting surfaces, each of said surfaces of said wedge-like member being predeterminably uniquely inclined relative to the floor of said tray for acting on respective different orientations of the objects and thereby enabling the objects to obtain said predetermined orientation in the associated channel regardless of the orientation thereof when encountering said wedge-like member, such that the objects when entering the channel will become disposed to pass through said exit port.

3,958,688

CONTAINER TURNER

Walter S. Sterling, Quincy, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.

Filed Sept. 23, 1974, Ser. No. 508,397
Int. Cl.² B65G *47/24*
U.S. Cl. 198—249 **29 Claims**



1. Apparatus for rotating containers traveling along a predetermined path standing upright thereon about their vertical axes to reverse their facing, comprising means for moving the containers along a predetermined path, means at one side of the path movable into engagement with the end of the container rearwardly of its axis with respect to the direction of movement for rotating the container angularly about its axis to displace said one end to the other side of said path and correspondingly to displace the opposite end of the container

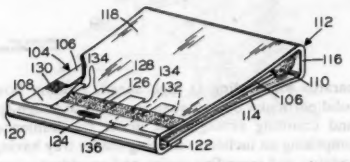
angularly about said axis to the one side of said path, means at the one side of said path arranged to intercept the forwardly facing side of the angularly displaced opposite end as the container travels forwardly to displace it angularly about said axis to a position rearwardly of said axis at said one side and correspondingly to displace the said one end angularly about said axis to a position forwardly of said axis at said other side and means at said other side of the path arranged to intercept the rearwardly facing side of said angularly displaced one end as the container travels forwardly to displace it angularly about said axis to a position such that both ends are aligned with said path.

3,958,689

MATCHBOOK

Edwin H. Roth, 321 Rear Adelia St., Middletown, Pa. 17057

Filed Apr. 1, 1975, Ser. No. 564,091
Int. Cl.² A24F *27/00*
U.S. Cl. 206—104 **16 Claims**



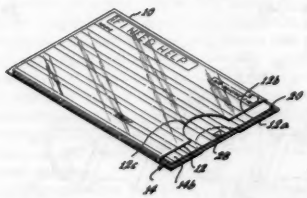
1. A matchbook comprising
a paperboard comb having a plurality of matches each having an ignition head at one end,
a paperboard cover folded over the ignition heads of the comb,
means securing the cover to the comb,
an igniting material on the cover,
said cover having a perforation such that a portion of the cover is readily removable, and
said readily removable cover portion containing at least a portion of the igniting material to impede ignition of matches on the igniting material when the readily removable cover portion is removed.

3,958,690

MEDICAL INFORMATION AND MEDICATION PACKAGE

Robert W. Gee, Sr., 18309 Faysmith Ave., Torrance, Calif. 90504

Filed Nov. 1, 1974, Ser. No. 520,019
Int. Cl.² B65D *85/56, 83/04*; A45C *15/00*
U.S. Cl. 206—232 **6 Claims**



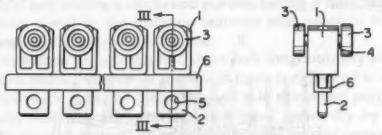
1. A medical identification, information, and emergency medication packet adapted for carrying or wearing by patient, said packet comprising:
a. an envelope, open at one end and closed at its other three sides;
b. a package insertable in said envelope, said package including
i. a cover card of rectangular configuration said card being foldable to divide the card into two portions, one portion, upon folding, being superimposed on the other portion;
ii. a frame of rectangular configuration conforming to the size and shape of the two card portions, said frame having an internal wall defining a recess; and
iii. a medication package configured to fit into said recess and between the card portions when the card is folded to effect such superimposition, thereof, one upon the other;
whereby said medication package may be completely enclosed between said two card halves and the internal wall of the frame defining said recess, said card portions having at least some of the patient's identification and medical information placed thereon and at least some notification of the patient's condition being visible from outside the envelope, so that in the event that the patient may become ill through an attack, such as one commonly experienced by diabetics or those suffering from other illnesses, any other person who may attempt to assist the patient upon seeing the packet in or upon the pocket and observing the notice visible thereon, may, upon withdrawing and examining the cover card, secure necessary instructions for relieving the patient and be provided with emergency medication to be administered to the patient in accordance with such instructions.

3,958,691

HANGER CARTRIDGE FOR FACILITATING ASSEMBLY OF TRAVERSE RODS

Bruce W. Schaeffer, St. Joseph, Mich., assignor to Kirsch Company, Sturgis, Mich.

Filed Dec. 26, 1974, Ser. No. 536,576
Int. Cl.³ B65D *85/00*
U.S. Cl. 206—326 **13 Claims**



1. A retainer for facilitating the insertion into a slotted traverse rod of a plurality of hangers, each said hanger having a head portion and pendant means depending from said head portion, said retainer comprising:
an elongated member having a plurality of openings therethrough, each of said openings being sized to receive snugly but slidably therein the pendant portion of one of said hangers, said elongated member being generally channel-shaped and comprising a web flanked by flanges, said openings being positioned through the web of said channel;
said openings being substantially the full width of the space between the flanges of said channel, said flanges at said opening being resilient and capable of being sprung outwardly, at least one side of said opening adjacent one of said flanges having a projection extending into said opening to an extent that a pendant projecting through said opening bears against said projection and distorts the adjacent side of said flanges sufficiently to develop a tension holding said projection firmly but slidably against said pendant and thereby holding said pendant snugly but removably in said opening.
A traverse rod assembly system, comprising:
a substantially linear, elongated retainer member having a web and flange means extending continuously alongside the web, longitudinally spaced segments of said web being omitted and providing a series of openings through said web and transversely extending substantially the width thereof;

a plurality of drapery hangers each having a head and a reduced width pendant extending downward from said head, said hangers each including downwardly facing surfaces at least adjacent the underside of said head and flanking the side edges of said pendant, each said hanger pendant extending through and being releasably fixed in a corresponding said opening in said retainer member with said head of said hanger above said retainer member, said downwardly facing surfaces of said hangers bearing on opposed upwardly facing surfaces of said retainer member to align said heads in a row parallel to and above said retainer member, said hanger pendant being adjacent said retainer member flange means;

an elongate traverse rod having a longitudinal slot means for receiving and longitudinally movable securing said hanger heads and along which slot means said retainer member is axially movable, said slot means including opening means responsive to movement of said retainer member alongside said traverse rod for loading the heads of said hangers carried by said retainer member into said slot means without contact of said traverse rod by said retainer member, said retainer member being held spaced from and substantially parallel to said traverse rod by ones of said hangers simultaneously engaging said retainer member and traverse rod, the securement of said hanger pendants to said retainer member being released by pulling said retainer member transversely away from said traverse rod when said hangers are loaded on such traverse rod.

3,958,692

SHAVING SYSTEM

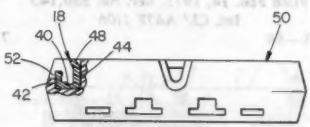
Edward E. Pomfret, Newbury, England, assignor to The Gillette Company, Boston, Mass.

Division of Ser. No. 381,768, July 23, 1973. This application Dec. 26, 1974, Ser. No. 536,484

Claims priority, application United Kingdom, July 25, 1972, 34715/72; July 25, 1972, 34716/72; July 25, 1972, 34717/72

Int. Cl.² B65D *83/10*

U.S. Cl. 206—359 **7 Claims**



1. As an article of manufacture and commerce, a package comprising a dispenser formed with a blade unit storage compartment and with razor-converter retaining means, at least one disposable blade unit removably accommodated in said storage compartment, each such blade unit comprising at least one pair of parallel tandem-acting cutting edges formed respectively on a pair of blade members secured together in spaced parallel relation, and at least one razor converter detachably engaged with said retaining means, each such razor converter being shaped and dimensioned to engage over and be retained upon the guard of a safety razor.

3,958,693

VACUUM X-RAY ENVELOPE

Franklin R. Greene, Flushing, N.Y., assignor to E-Z-EM Company Inc., Westbury, N.Y.

Filed Jan. 20, 1975, Ser. No. 542,256

Int. Cl.² B81D *81/20*; B03B *41/18*

U.S. Cl. 206—455 **10 Claims**

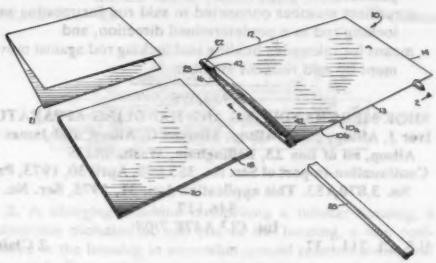
1. A reuseable envelope for an X-ray cassette having X-ray film and intensifier screen comprising:

first and second collapsible sheets sealed to one another along first, second and third sealed edges forming an envelope having an open edge,

a sealing zone extending across said open edge between said first and second sealed edges,

said sheets having polished facing interior surfaces in said sealing zone,

said interior surfaces in said sealing zone being flush against



each other at the line of the seal at said first and second sealed edges, the seal at said first and second sealed edges being beadless in said sealing zone, and

a valve sealed to one of said sealed edges permitting communication between the interior of said envelope and the outside, said valve being positioned away from said sealing zone.

3,958,694

IMPROVEMENTS IN MERCHANDISE DISPLAY WITH SECURITY LOCK

Peter G. Pritz, c/o Trico Non Ferrous Metal Products, Inc., Wyandotte Road, Willow Grove, Pa. 19090

Filed Dec. 27, 1974, Ser. No. 536,908

Int. Cl.² E05B *73/00*

U.S. Cl. 211—4 **10 Claims**

1. A merchandise display for articles to be protected from pilferage comprising

an enclosing housing portion having an elongated front wall with at least one pair of spaced sockets having openings facing toward each other and extending outwardly from the front wall for the reception of spaced portions of the article to be displayed,

one of said sockets having an end abutment for contact by one of the spaced portions of the article,

a locking rod longitudinally disposed within said housing and extending beyond said sockets and pivotally mounted in said housing,

said locking rod having an operating portion accessible through one end of said housing for movement thereof,

said locking rod having a locking pin rigidly secured thereto and movable to a position in locking engagement with another of the spaced portions of the article within the other of said sockets and to an out of locking engagement position,

a resilient member connected to said rod for rotating said locking rod in a predetermined direction, and

means for releasably holding said locking rod against movement by said resilient member.

3,958,695

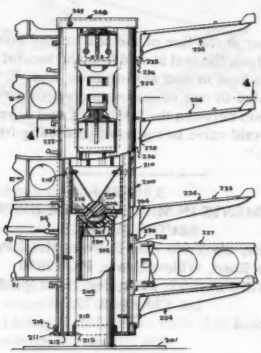
SHOE MERCHANDIZING AND HANDLING APPARATUS

Ivor J. Allsop; Jon I. Allsop; Michael G. Allsop, and James D. Allsop, all of Box 23, Bellingham, Wash. 98225

Continuation-in-part of Ser. No. 355,698, April 30, 1973, Pat. No. 3,870,153. This application Jan. 31, 1975, Ser. No. 546,117

Int. Cl.² A47F *7/08*

U.S. Cl. 211—37 **2 Claims**



1. As a new article of manufacture, a shoe merchandizing and handling apparatus comprising a horizontally disposed base, a vertically disposed post secured to said base and extending upwardly therefrom, a support piece mounted on the upper end of said post and said support piece including a reduced diameter section that is snugly received in the upper end of said post, said support piece including an annular flange as well as a top portion, said top portion having a recessed surface, a vertically disposed rotary hollow column having a body piece securely mounted therein, a ball depending from the lower surface of said body piece and said ball having a rotary fit in said recessed surface whereby the column can rotate about a vertical axis extending through the post, a bottom piece mounted on the lower end of said column and said bottom piece including a lower flat section that has a circular opening therein for the projection therethrough of said post, said bottom piece being provided with outer and inner upstanding flanges that are arranged in spaced relation with respect to each other, said column including side portions having flanges thereon defining channels, and said side portions including intermediate generally flat sections, superimposed brackets having base portions mounted in the channels on certain of the sides of said column, and said column including curved corner sections, and bars detachably mounted between certain of said brackets, and shoe holding members on said bars.

3,958,696

PORTABLE HANGER DEVICE

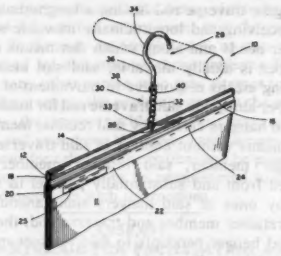
John J. Leonas, 17417 Center Ave., E. Hazelcrest, Ill. 60429

Filed Apr. 30, 1973, Ser. No. 355,388

Int. Cl.² A47B *63/02*

U.S. Cl. 211—45 **2 Claims**

1. A portable hanger device for suspending articles, such as plans, drawings, catalogs, posters, and the like, comprising an elongated rigid support bar, an article connecting member formed of a flexible synthetic plastic material having a sleeve surrounding said bar and a pair of elongated flanges integral with said sleeve and extending laterally from one side of the sleeve, said flanges being adapted to be permanently secured to respective opposite sides of an article to be suspended, said bar having an aperture at the midpoint thereof, said sleeve having a pair of opposed apertures in alignment with each other and the aperture in said support bar, and a flexible hanger connected to said support bar and article connecting member, said hanger being centrally disposed with respect thereto and comprising a length of chain having a plurality of



links, one of said links passing through the apertures in said sleeve and said support bar, said one link being permanently coupled to said bar, and a hook having a base portion with an aperture extending therethrough, said length of chain having another link passing through said aperture in the base portion of said hook and being permanently secured thereto.

3,958,697

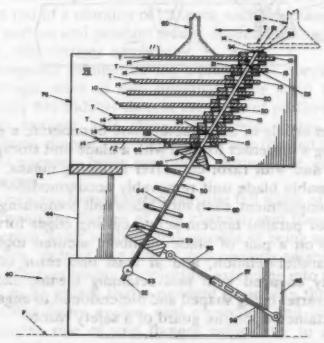
LEVELING AND UPWARDLY ELEVATING APPARATUS FOR REINFORCED PERFORATE TAGS

Richard L. Brown, 1812 Pelton Ave., Bellevue, Nebr. 68005, and Warren R. Nohrenberg, 9229 Fowler St., Omaha, Nebr. 68134

Filed Feb. 14, 1975, Ser. No. 550,143

Int. Cl.² A47F *1/06*

U.S. Cl. 211—54 **7 Claims**



1. Leveling and upward elevating assembly for and including an upwardly extending stack of identical perforation-reinforced tags including an uppermost tag and a lowermost tag, said individual tags being of identical geometric size and shape and gravimetric weight and comprising a longitudinally semi-flexible sheet material card main body and also a geometrically-offset reinforceably-surrounded perforate portion reinforced structurally by surrounding grommet, eyelet, or the like, whereby said structurally reinforceably-surrounded perforate portion provides the tag's thickest part, each said semi-

flexible card having at least two peripheral edges including a transversely extending remote free-edge located most remote from the reinforced perforation and a longitudinally extending lineal sideward-edge, said leveling and upward elevation assembly including the stacked tags comprising:

A. a stationary underlying base means adapted to stably rest upon a suitable horizontal substrate;

B. an upright uniplanar elongate-rod extending obliquely upwardly from the base means and said horizontal substrate and loosely slidably passing through the reinforceably-surrounded perforation of each card, the elongate-rod upper-end being loftily elevated above the base means and slightly above the uppermost tag of the slidable stack, opposite bearing-sides of the elongate-rod forceably tiltably bearing against vertically-separated locations of the reinforceably-surrounded perforation of each tag thereby creating a horizontal and parallel relationship among the several semi-flexible cards and a spatial-gap also created between the remote free-edge of the cards, said oblique elongate-rod lying substantially parallel to that common upright-plane defined by the lineal sideward-edge of the several stacked cards and whereby in top plan view the geometrically similar free-edge of each of the stacked cards is visually discernible in stepwise array; and

C. upward elevation means actuatably upwardly extending from the base means to the lowermost tag's perforation reinforcement to maintain the uppermost of the slidably stacked parallel cards at a substantially constant elevation which is slightly below the elongate-rod upper-end.

3,958,698

PIPE BUNDLE EXTRACTING/INSERTING DEVICE

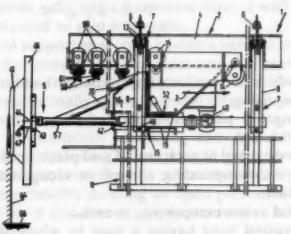
Barend van der Woerd, Muiderberg, Netherlands, assignor to N.V. Machinefabriek Stork-Jaffa, Utrecht, Netherlands

Filed May 15, 1974, Ser. No. 470,118

Claims priority, application Netherlands, May 21, 1973, 7307086

Int. Cl.² B66F *1/00*

U.S. Cl. 214—1 P **6 Claims**



1. A pipe bundle extracting/inserting device comprising a gripper capable of engaging a bundle of pipes and pulling means coupled with said gripper for moving said gripper along a predetermined axis, the gripper comprising a clamp having at least two clamping jaws adapted to engage the outer circumference of a front flange of the bundle of pipes and means rotatably mounting said clamp for rotation about said axis, said clamp including support means and a pair of levers pivotally engaged between their ends by said support means, said levers being engaged by said support means considerably closer to one end thereof than to the opposite end thereof, a clamping jaw at said one end of each lever, and a jack reacting between said opposite ends of said levers.

3,958,699

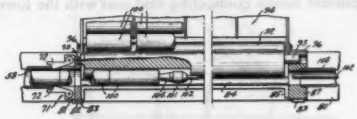
CHARGING MACHINE

John B. Medlin, Newark, Del., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 13, 1954, Ser. No. 443,187

Int. Cl.² G21C *19/20*; F23K *3/00*

U.S. Cl. 214—23 **3 Claims**



2. A charging machine comprising a tubular housing, a connector mounted at one end of the housing, a seal positioned in the housing in somewhat spaced relation to the said one end, first and second latches mounted on the tubular housing so as to project thereinto, the first latch being adjacent the seal on the side thereof away from the said one end, the second latch being adjacent the other end of the tubular housing, a charging trough connected with the said other end of the tubular housing and extending therefrom in alignment therewith, a loading tray connected with and extending laterally therefrom, an indexing means for moving a group of objects from the tray to the trough, means moving in the trough from the end thereof away from the tubular housing to the first latch for pushing the group of objects in the trough through the tubular housing so as to position the last object of the group in the seal and in latching relation with the first latch and the other objects of the group beyond the seal in the tubular housing and in a treating device in which liquid under pressure flows continuously and to which the charging machine is attached by the connector, the first latch engaging the said last object of the group to prevent the pressure liquid in the treating device from forcing the group to follow the pushing means when it withdraws to permit a new group of objects to be indexed from the tray to the trough, the said last object cooperating with the seal to prevent pressure liquid from entering the charging machine farther than the seal, and an extensin adapted to be applied to the pushing means for expelling all objects of a final group into the treating device by movement of the pushing means to the first latch, the extension being adapted to overlap the pushing means so as to be prevented from being held by the first latch and thus being caused by the pressure fluid of the treating device to follow the pushing means during its withdrawal as far as the second latch, the second latch holding the extension in a position in which it is withdrawn from the treating device and lies within the seal, whereby the charging machine may be detached from the treating device and the pressure fluid in the treating device is prevented from penetrating the charging machine. beyond the seal.

3,958,700

CHARGING MACHINES

Wilfred Francis Foy, Salford, and Lewis Ainsley Watson, Caarbrook, Stalybridge, both of England, assignors to Simon-Carves Limited, Great Britain

Filed June 21, 1974, Ser. No. 481,760

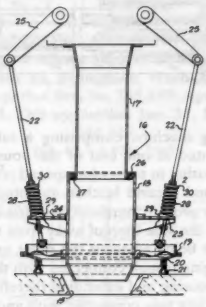
Claims priority, application United Kingdom, July 9, 1973, 32663/73

Int. Cl.² B66C *17/08*; C10B *31/04*

U.S. Cl. 214—35 R **13 Claims**

1. A charging machine for coke oven batteries comprising a structure adapted to extend transversely of a coke oven battery on the roof thereof for movement longitudinally of the battery to overlie any selected oven chamber and supporting a number of hoppers adapted to be filled with coking coal, each such hopper having means for connecting the base

thereof with an aperture in the roof of an oven chamber for transfer of coking coal from the hopper to the oven chamber, and said means for connecting the base of each hopper with an aperture in the roof of an oven chamber comprising a downwardly directed telescopically extendible sleeve, characterized by the provision of an annular seal outwardly spaced from and surrounding the lower end of said sleeve and adapted to engage with the oven roof surrounding an aperture in an oven chamber on lowering of said sleeve, there being gas tight resilient means connecting said seal with the lower end



of said sleeve means for urging said annular seal downwardly into engagement with the roof of the oven chamber, said downwardly directed telescopically extendible sleeve comprising a lower part which is adapted to be raised and lowered relative to an upper part secured to the charging machine, and an annular frame from which said annular seal protrudes downwardly surrounding said lower part of the sleeve, said resilient means being comprised by a flexible diaphragm which closes the annular spaced defined between the outer periphery of said lower part of the sleeve and said annular frame.

3,958,701

LOAD-SHIFTING CARGO TRANSFER APPARATUS

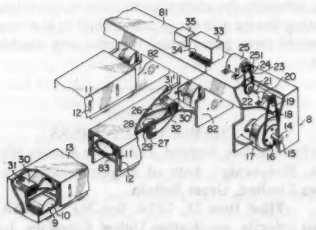
Shukuro Yatagai, and Katunori Tamura, both of Kitakyushu, Japan, assignors to Japanese National Railways, Tokyo, Japan

Filed Feb. 13, 1974, Ser. No. 442,001

Claims priority, application Japan, Feb. 22, 1973, 48-22264[U]

Int. Cl.² B65G 67/02

U.S. Cl. 214—38 C **1 Claim**



1. A load shifting type cargo transfer system comprising:

a. a stationary unit having a plurality of equally spaced parallel projections of the same height and width; and

b. a mobile unit comprising,

a main frame means,

a support means including a plurality of unitary H-shaped tines extending perpendicularly from said main frame means, wherein each tine has at least one roller extending from the bottom thereof,

unitary cargo holder means having a top surface and side surfaces extending downwardly therefrom surrounding a portion of each of said tines, wherein said cargo holder means are dimensioned to fit between the projections of said stationary unit, and said cargo holder means includes closed guide slots and said tines include knock-pins, said knock pins extending into said guide slots thereby limiting the upward and downward movement of said cargo holder means relative to said tines,

lifter means for raising and lowering said cargo holder means with respect to said tine, said lifter means including a hose positioned between said tines and said cargo holder means in the upper portion of said H wherein said hose in inflated and deflated by the insertion and withdrawal of a working fluid therefrom, and the sides of the upper portion of said H provides lateral stability to said side surfaces of said cargo holder means, and

drive means mounted on said main frame means for moving said mobile unit, said drive means comprising a prime mover and drive wheel means operatively connected to said prime mover wherein said drive wheel means extend from the bottom of said main frame means.

3,958,702

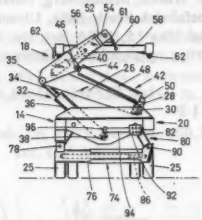
MOBILE LOAD HANDLING APPARATUS

Albert Michael Hand, Cheltenham, Canada, assignor to Steadman Containers Limited, Brampton, Canada

Filed Jan. 2, 1975, Ser. No. 538,084

Int. Cl.² B65G 67/04; B60P 1/48

U.S. Cl. 214—38 CA **6 Claims**



1. Mobile load handling apparatus for handling elongated loads comprising:

an elongated platform supported at an elevation above ground, and

a crane disposed at each end of said platform, for alignment with a corresponding end of an elongated load to be handled,

each said crane comprising, in turn,

an elongated mast having a base by which it is pivotally attached to said platform at one side thereof for radial movement between one position in which it is disposed substantially horizontally across the corresponding end of the platform and another position in which it is disposed substantially erectly at the same side of the platform,

a jack pivotally interconnected between said mast and said platform and extendable and contractable to move the mast between its two positions as aforesaid,

said jack being pivotal about a fixed point substantially below the level at which said mast is attached to said platform and generally centrally of said platform,

said mast having a free end opposite said base and an arm attached thereto at said free end for swinging thereon between an outstretched position in which it is in substantial axial alignment with said mast and a jack-knife position in which it forms a sharply acute angle with the mast,

a jack interconnected between said mast and said arm and extendable and contractable to move the arm between the two positions aforesaid relative to the mast,

said arm having a free end remote from its point of attachment to the mast and an extension at said free end which is retractably propellable to lengthen and shorten said arm,

a double-ended beam suspended from said extension and balanced to retain a substantially horizontal orientation irrespective of the positioning of said arm, and

means at each end of said beam co-operable with complementary means correspondingly spaced and located at one end of said elongated load for selectively engaging the top of said load at said one end,

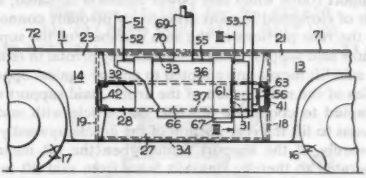
the height of said platform and the proportions of said mast and arm being scaled to enable stacking of two standard freight containers one on top of the other on one side of the platform and loading of one such container on a vehicle of standard height on the other side of the platform.

3,958,703

SIDE LOADER MAIN FRAME

George P. Marco, Homewood, and Edward V. Krutis, Monee, both of Ill., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 13, 1974, Ser. No. 523,488
Int. Cl.² B60P *1/44*
U.S. Cl. 214—75 G **10 Claims**



1. In a side loader vehicle, a frame comprising: a front wheel supported section having a vertical side wall at each of its laterally opposite sides and a transverse vertical wall at its rear end rigidly secured to said side walls,

a rear wheel supported section having a vertical side wall at each of its laterally opposite sides and a transverse vertical wall at its front end rigidly secured to said side walls and in longitudinally spaced parallel relation to said transverse vertical wall on said front section,

a pair of longitudinally extending and vertically spaced torque tubes extending between and rigidly connected to said transverse vertical walls adjacent one lateral side of said frame thereby defining an open pocket in the other lateral side of said frame adapted to receive a traversing mast, and

a pair of parallel guide structures rigidly secured to said transverse vertical walls and extending transversely across the width of the latter and between said torque tubes.

3,958,704

PIPE LAYING ATTACHMENT

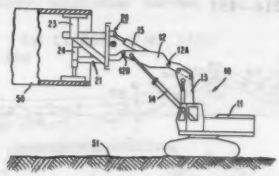
Philip J. Wire, 4134 Auxarms Drive, Apt. 2, Memphis, Tenn. 38128, and James M. Stephenson, 3228 Lichen Drive, Bartlett, Tenn. 38134

Filed Jan. 27, 1975, Ser. No. 544,177
Int. Cl.² B66F *9/00*
U.S. Cl. 214—130 C **15 Claims**

1. A pipe carrying and laying attachment for construction equipment, said attachment comprising:

a support frame, a plurality of radially extending arms projecting from said frame, and support shoes at the extended terminal ends of the arms;

at least one of said arms including first actuator means for adjusting the radial position of its associated support shoe;



a platform plate connected to said support frame;

a coupling plate and means connecting said coupling plate to said platform plate for relative movement therebetween;

second actuator means intermediate said coupling and said platform plate for effecting adjustment of said platform plate relative to said coupling plate; and,

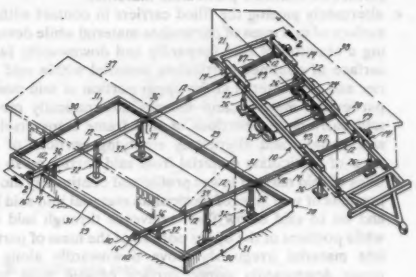
means on said coupling plate to permit coupling of said attachment to construction equipment.

3,958,705

METHOD FOR MOVING AND ALIGNING MODULAR HOUSE UNITS ONTO A FOUNDATION

Bobby G. Baxter, Rte. 3, Box 3, Warrenton, Mo. 63383

Division of Ser. No. 339,081, March 8, 1973, Pat. No. 3,887,083, which is a continuation-in-part of Ser. No. 216,204, Jan. 7, 1972, Pat. No. 3,794,186. This application July 22, 1974, Ser. No. 490,577
Int. Cl.² B65G *67/24*
U.S. Cl. 214—152 **6 Claims**



1. A method of transferring a module unit from a transporter to a module foundation comprising the steps of positioning the transporter supporting the module unit alongside the foundation, placing spaced tracks between the transporter and module so as to extend across the foundation, mounting six-way roller pads between the module and the tracks such that the module is supported on the pads, each pad having roller means for movement of the pads along the tracks and transverse movement of the module relative to the tracks, and each pad further including means providing rotation of the module relative to the tracks about a generally vertical axis, moving the module along the tracks to its final position on the foundation, transversely adjusting the position of the module as necessary before the tracks and pads are removed, and removing the tracks and pads from between the module and the foundation.

3,958,706

STORAGE UNLOADING PROCESS

Eugene V. Ridlehuber, 1720 Canyon St., Plainview, Tex. 79072

Division of Ser. No. 387,113, Aug. 9, 1973, Pat. No. 3,838,780. This application Aug. 7, 1974, Ser. No. 495,406

Int. Cl.² B65G *65/42*

U.S. Cl. 214—152 **4 Claims**

1. Process of smoothly unloading a mass of particulate material on the floor of a flat-floored storage building to a below-floor conveyor at a uniform rate, concurrent with and notwithstanding usual surges in downward discharge from the upper portions of such particulate mass, said mass of particulate material having an upper downwardly sloped surface, said mass composed of portions of different resistance to flow and having different angles of repose, said building having peripheral vertically extending side walls, comprising the steps of:

a. moving a series of like forwardly open mouthed closed bottom carriers forwardly along the length of a longitudinally extending frame therefor above said floor in direction of and into a hole in said floor above said below floor conveyor along the upper surface of the mass of particulate material being unloaded along the length of said frame in a downwardly sloped direction transverse to said downwardly sloped upper surface of said mass of particulate material in a horizontally extending direction from near a side wall of the storage building to a vertical passage in the floor of that building to the below-floor conveyor;

b. filling each of said carriers and confining therein a mass of particulate material and forming on the forward open mouth of such carrier a downwardly and forwardly facing surface of confined particulate material;

c. alternately passing the filled carriers in contact with the surface of said mass of particulate material while developing a reaction of said forwardly and downwardly facing surface of confined particulate material within said carrier and the material at the upper portion of said mass of particulate material and thereby automatically moving said carriers and portions of said frame transversely to said surface and alternately emptying portions of said mass of particulate material from said carrier on to portions of said mass of lower profile and continually moving portions of said mass of particulate material into said hole and on to said below floor conveyor through said hole while portions of the upper portion of the mass of particulate material irregularly move downwardly along the upper downwardly sloped surface of said mass transversely to the direction of motion of said carriers;

d. whereby said carriers on said above-floor conveyor assembly even out irregularities in the downward flow rate in a downward and horizontal direction from the said mass of particulate material and the said below-floor conveyor operates without surges thereinto or therefrom.

3,958,707

CONTAINER TRANSPORT TRAILER

David L. Deppe, 521 - 3rd Ave., Baraboo, Wis. 53913

Filed June 24, 1974, Ser. No. 482,519

Int. Cl.² B60P *1/64*

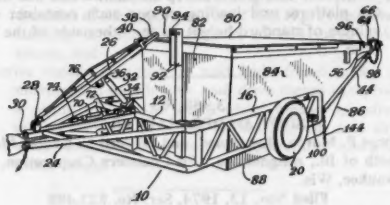
U.S. Cl. 214—390 **8 Claims**

1. A bottomless article transport trailer for transporting a sturdy, rigid article comprising, in combination:

a support frame mounted for vehicular movement on a pair of wheels, said frame having a cross member and a pair of side members said cross member connected to the forward ends of the side members;

a hitch section connected to said cross member;

a lift means operable between an article conveying position and an article release position connected to said hitch section adjacent the cross member of the support frame and connectable with the front end of the article to be transported, said lift means comprising a lift arm having a pivoting end and an article engaging end, said pivoting end pivotally connected to said hitch section, and a power means pivotally connected at one portion thereof to said hitch section and at another portion thereof to said lift arm intermediate said pivoting end and said article engaging end, said article engaging end of said lift arm adapted to engage with the front end of the article and to lift said front end of the article upwardly and inwardly of the support frame when said power means is actuated; and



a pair of elongated support arms freely pivotally connected to the rear portions of the side members of the support frame said support arms independently pivotal in relation to said lift means and adapted to engage against opposite sides of the rear portion of the article, said support arms adapted to cooperate through said article with said lift means to lift the rear portion of the article upwardly and inwardly of the support frame when the lift means is operated to thereby transmit force from said lift means through said article to said support arms whereby the article may be suspended for vehicular movement within the bottomless trailer above the surface supporting the wheels of the trailer.

3,958,708

OVERSIZED SAFETY CAP

Michel A. Le Brun, Jr., Sebastopol, Calif., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed May 5, 1975, Ser. No. 574,790

Int. Cl.² B65D *55/02, 85/56;* **A61J** *1/00*

U.S. Cl. 215—216 **8 Claims**

1. A safety cap forming a closure member for a container having an integral bottom, continuous sidewall and annular upper shoulder extending up to a neck portion whose upper end forms the opening to said container, said neck including thread means formed thereon adjacent to said upper end opening, a cam member having at least one recess adjacent to the eccentric portion of said cam member constructed on said

neck portion in the vicinity of said shoulder and the lower end of said neck threads;

said cap having an inner cup means for sealing said container, including a top integral with a continuous depending sidewall means, one portion of said depending sidewall means having threads formed thereon adapted to mate with the neck threads of said container, at least one downwardly projecting lug formed on another portion of said depending sidewall means adapted to contact said cam member when said threaded portion of said cap is adjacent to its sealing position on said neck, and a lower portion of said depending sidewall means extending sufficiently below said cam member and laterally spaced from said neck portion to permit said projecting lug portion to clear said recess of said cam member for disengagement of said safety cap from said container; and

an over cup member, larger in diameter than the span of a child's hand so that a child is unable to open said safety cap, substantially surrounding said inner cup means having a top and integral side;

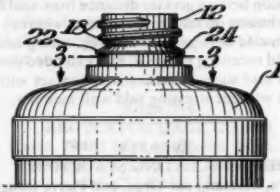
said over cup member connected to said inner cup means, so that when a force is exerted against said over cup member to said inner cup means at predetermined positions, said inner cup means and said over cup member are transversely deformed to disengage said projecting lug portion from said recess of said cam member.

3,958,709

CONTAINER SAFETY CLOSURE SYSTEM

Frank S. Nixdorff, Baltimore, Md., assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Nov. 11, 1974, Ser. No. 522,619
Int. Cl.² B65D *55/02, 85/56;* **H61J** *1/00*
U.S. Cl. 215—221 **23 Claims**



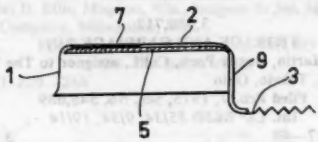
1. A safety closure system comprising, in combination, a container having a neck with an opening through which the container contents are dispensed, a cap removably covering said container neck opening, engaging means on said cap engaging complementary engaging means on said container neck, a locking ring, mounting means on said locking ring and said neck mounting said ring to said container neck, locking means on said locking ring, complementary locking means on said cap for selective engagement with said locking means on said ring, inactivating means associated with one of said locking means for disengaging said ring locking means from said cap locking means whereby said cap may be removed from the container neck only when said cap locking means is disengaged from said ring locking means, first positioning means on said locking ring, second positioning means on said cap for contacting said first positioning means while said cap is being inserted on said neck to orient said ring locking means for proper positioning with respect to said cap locking means to assure proper engagement therewith, and said mounting means being structured for one directional movement of said ring with respect to said container neck to permit said cap and said ring to move jointly in a closing direction when said cap is inserted over said neck and to prevent an opposite opening direction of movement of said ring with respect to said container neck.

3,958,710

BOTTLE CAP WITH GASKET

Sune Hårding, Bromma, and Per-Åke Andersson, Linkoping, both of Sweden, assignors to Aktiebolaget Wicanders Korkfabriker, Stockholm, Sweden

Continuation-in-part of Ser. No. 132,520, April 8, 1971, abandoned. This application Nov. 12, 1973, Ser. No. 414,789
Claims priority, application Sweden, Apr. 14, 1970, 5044/70
Int. Cl. B65d *41/42, 53/04*
U.S. Cl. 215—254 **6 Claims**



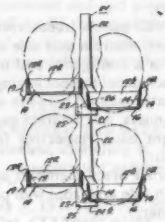
1. A cap for a container having a neck defining an opening, said cap comprising an upper wall to overlie the opening and having a peripherally depending skirt to engage the neck to secure the cap in position over the opening, a pair of spaced score lines on said wall defining a tear portion, and a sealing element including a portion covering the opening and bonded to part of the inside surface of said wall and across each of said score lines no more than half-way between opposite edges of said wall from one of said edges.

3,958,711

EGG TRAY

Robert C. Morris, Trappe, and Raymond C. Gantert, Cambridge, both of Md., assignors to Multifax Corporation, Easton, Md.

Filed Sept. 18, 1975, Ser. No. 614,611
Int. Cl.² B65D *85/32*
U.S. Cl. 217—26.5 **10 Claims**



1. A unitary egg tray comprising:

a plurality of integrally connected egg-holding tubular receptacles arranged in transverse and longitudinal rows in said tray, said tubular receptacles in each row being staggered with respect to the tubular receptacles in the immediately adjacent parallel rows on either side of it, said transverse amd longitudinal rows of tubular receptacles occuppying in alternate sequence an upper horizontal plane and a lower horizontal plane, said tubular receptacles being of uniform size and shape at their upper perimeter so that they can receive and abut the lower midportion of an egg, each said receptacle having an orifice at its lower perimeter of such size and shape to provide clearance between the orifice and the lowermost part of the pointed tip of an egg nested in the receptacle, whereby each receptacle is adapted to hold in stable position eggs of varying size distribution,

leg means positioned at two parallel opposed sides of said tray to support the tray, said leg means protruding to aa

support level slightly below the horizontal plane tangent to the bottom of the lowermost egg tip held in said tray and also below the lowermost part of the receptacles;

stacking means protruding above the tubular receptacles in the upper plane of the tray for supporting and releasably interlocking with an adjacent tray disposed in such closely-spaced horizontal relation immediately above it so that the upper tray will not contact eggs in the lower tray; and

socket means on the underside of said tray adapted to receive the stacking means of a downwardly adjacent lower tray, said socket means being above the support level of said leg means.

3,958,712

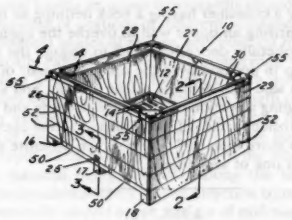
STORAGE AND CARRIAGE BIN

James J. Martin, Buena Park, Calif., assignor to The Martin Brothers, Toledo, Ohio

Filed Feb. 7, 1975, Ser. No. 548,089

Int. Cl.² B65D *85/34, 9/34, 19/14*

U.S. Cl. 217—40 **3 Claims**



1. A storage and carriage bin forming a substantially rectangular container for farm produce, comprising:

a slotted bottom deck;

a plurality of parallel runners secured to the underside of said bottom deck;

a pair of side wall panels positioned in parallel relationship to said runners;

a pair of front wall panels transversely positioned to said parallel runners, wherein said side and front wall panels are arranged in a contiguous end-to-end relationship to each other, each panel thereof having an upper free edge;

a pair of base plates secured between said bottom deck and one of said runners, and wherein each base plate is positioned adjacent each respective front wall panel and secured thereto;

a plurality of corner brace members secured at each intersection of each side and front wall panel forming corners in said container;

an upper longitudinal cleat member secured to each of said wall panels along said upper free edge thereof, said cleat having at least one beveled, longitudinal, leaving edge thereon, and a protective longitudinal edge disposed over the peripheral edge of each wall panel, whereby said panels are protected from damage;

a lower longitudinal cleat member secured to each of side wall panels adjacent the bottom deck and having at least one beveled, longitudinal, leading edge thereon;

a plurality of longitudinal twist wires mounted to the periphery of said wall panels, whereby said panels are secured in an end-to-end manner;

a pallet means comprising said runners and said bottom deck; and wherein

said side wall panels extend downwardly, forming an overlapping extended portion, said extended portion being secured to said runners, providing a positive interconnecting structure, whereby the lifting force applied to said bin is absorbed evenly throughout the interconnected structure; and wherein

said front panels terminate above said runners, providing an opening between said runners, forming said pallet means.

3,958,713

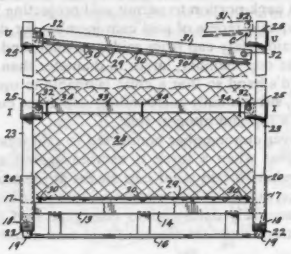
COLLAPSIBLE WALL CONTAINER

John C. Selz, 2628 Middlesex Drive, Toledo, Ohio 43606

Continuation-in-part of Ser. No. 353,398, April 23, 1973, Pat. No. 3,883,026. This application Feb. 27, 1975, Ser. No. 553,806

Int. Cl.² B65D *7/24, 7/20;* B65J *1/02*

U.S. Cl. 220—6 **5 Claims**



1. A container comprising a floor, support members connected to said floor, vertical posts removably received by said support members, a resilient wall member being connected to said floor and having a free, non-connected upper edge for extension of said wall member from a first collapsed position to a second extended position, means adjacent said free edge for supporting said wall member and means for receiving said supporting means on said vertical posts, said free edge in said extended position being a greater distance from said floor than said receiving means on said vertical posts; whereby said wall is erected from said collapsed position by raising said support means over said receiving means to said extended position and then lowering said support means into contact with said receiving means without stressing said wall member.

3,958,714

HEAT-INSULATING STRUCTURE

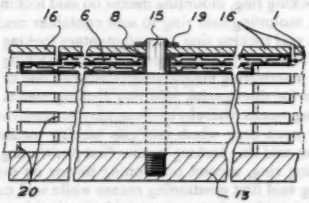
Andre Barriere, Morsang-sur-Orge, and Pierre Rough, Orsay, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 7, 1974, Ser. No. 440,506

Claims priority, application France, Feb. 15, 1973, 73.05388

Int. Cl.² B65D *7/12*

U.S. Cl. 220—10 **2 Claims**



1. A heat insulating apparatus comprising a plurality of metallic modular members each defining two stacked compartments, each compartment having the shape of a right-angled parallelepiped, said compartments communicating through a common internal face defining overlapping edge portions, said members being disposed in a stacked relationship with their respective edge portions extending in an imbri-

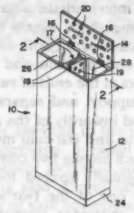
cated relationship, a tie bolt extending through said tubular member, a pressure plate engaging the outermost member and cooperating with said tie bolt to clamp said members in said stacked relationship, and a tubular member extending perpendicular to and attached to said members and cooperating with said tie bolt for maintaining said members in a predetermined alignment.

3,958,715

PARTITIONED VENTILATED CLOTHES HAMPER

John J. Capelli, Brooklyn, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Oct. 6, 1975, Ser. No. 620,169
Int. Cl.² B65D *1/24*
U.S. Cl. 220—22 **4 Claims**



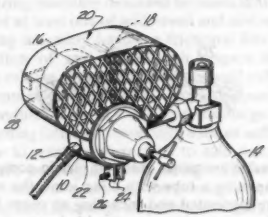
1. A partitioned ventilated clothes hamper comprising:
an open-top elongated receptacle;
a cover pivotally connected to said receptacle so as to be pivotable between a first closed position where the open top of the receptacle is covered and a second open position where access is provided to the interior of the receptacle;
and a hollow foraminous partition extending lengthwise within the receptacle to thereby divide the receptacle into separate compartments.

3,958,716

REGULATOR GAGE GUARD

Russell J. Korte, 79401 McKay, Romeo, Mich. 48065

Filed Apr. 18, 1975, Ser. No. 569,585
Int. Cl.² B65D *25/00*
U.S. Cl. 220—85 P **2 Claims**



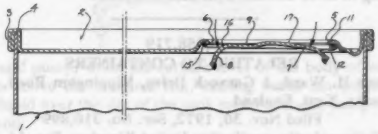
1. A gage guard for regulator-gage assemblies of the type including a regulator having a cylindrical body and a plurality of indicator gages mounted on the body and projecting radially therefrom in circumferentially spaced disposition, said gage guard comprising: a guard band of rigid, breakage-resistant material formed into an elongated loop with the ends thereof spaced apart, said loop being of such size as to accommodate therein said indicator gages such that the gages are substantially enclosed by the band, a clamp ring adapted for disposition about the regulator body, adjustor means for tightening and loosening the ring about the body, the terminal ends of the guard band being secured to the clamp ring at spaced points on the ring such that a minor portion of the ring projects partially into the loop between the terminal ends thereof but the major portion of the clamp ring including the adjustor means extends outside of the interior of the guard band such that when the clamp ring is installed on the regulator body, the guard band encloses an area radially outwardly of the regulator body, and a protective grid secured to the guard band adjacent an edge thereof so as to protect the faces of said gages.

3,958,717

LID CONSTRUCTION FOR A CONTAINER

Nicholas D. Ellis, Mequon, Wis., assignor to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Filed Aug. 15, 1975, Ser. No. 605,199
Int. Cl.² B65D *41/32*
U.S. Cl. 220—268 **11 Claims**



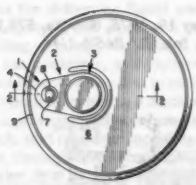
1. A lid construction for a container, comprising a lid having a vent opening and a pouring opening, said pouring opening having a substantially greater area than the vent opening and being located radially outward of said vent opening, said vent opening and pouring openings being located in proximate relation with the area between said openings defining a hinge section, a vent tab enclosing the vent opening and integrally connected to said hinge section, a severable connection connecting the edge of the vent tab to the portion of the lid bordering the vent opening, a pouring tab enclosing the pouring opening and integrally connected to the hinge section, and a second severable connection connecting the edge of the pouring tab to the portion of the lid bordering the pouring opening, said vent tab adapted to be pushed inwardly of the lid to vent the pressure in the container and said pouring tab adapted to be pushed inwardly of the lid to expose the pouring opening, said vent tab and said pouring tab remaining attached to said hinge section after being pushed inwardly of the container.

3,958,718

PULL TAB FOR NESTED TAB SAFETY CLOSURE

John J. Kowalik, Glenview, and Gary K. Hasegawa, Morton Grove, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed July 3, 1975, Ser. No. 593,410
Int. Cl.² B65D *41/32*
U.S. Cl. 220—273 **5 Claims**



1. An improved pull tab for use in a child-resistant safety closure of the type wherein the tab is mounted flat against the end panel and shield means on said end panel obstruct grasping of said tab, said tab comprising a nose portion, an intermediate portion and a handle portion, said portions being substantially coplanar, said end panel having a score defining an

opening flap therein and said nose portion having means for fracturing said score to open said flap, said shield means comprising at least one raised protrusion formed in said end panel, said one protrusion being outside said tab and completely surrounding the periphery of said handle portion, fulcrum means on said intermediate portion accommodating tilting said tab relative to said end panel and tilt enhancing means on said nose portion, said fulcrum means comprising a rivet well, including a sidewall and a base, said tab being rockably attached to said end panel, said tilt-enhancing means comprising said fracturing means formed as a panelward curl on the edge of said nose portion to provide clearance between said tab and said end panel, both of said means cooperating whereby panelward displacement of said nose portion tilts said tab about said fulcrum, displacing said handle portion away from said shield means to a position whereat it may be grasped, said base of said well being substantially flat and substantially parallel to the principal plane of said tab and sitting in close contact with said end panel.

3,958,719

RELATING TO CONTAINERS

Dennis H. Ward, 1 Garvock Drive, Kippington Road, Sevenoaks, Kent, England

Filed Nov. 30, 1972, Ser. No. 310,899

Claims priority, application United Kingdom, Dec. 16, 1971, 58474/71

Int. Cl.[2] B65D *41/04*

U.S. Cl. 220—288 **12 Claims**

1. A coupling member for an outwardly projecting neck of a container wherein the container neck terminates in an outer free edge, said coupling member comprising a sleeve adapted to be inserted into the container neck, securing means of the snap locking type engageable over an outwardly projecting container neck for releasable securing the sleeve to the neck, sealing means automatically engageable when the sleeve is inserted into the neck for sealing the sleeve with respect to the neck, the sleeve having an internal screw thread adapted to engage a screw threaded bung used to close the container neck, and locking means for locking the sleeve with respect to the container neck to prevent relative rotation.

3,958,720

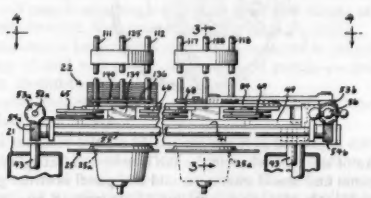
ADJUSTABLE MULTIPLE CONTAINER DISPENSING APPARATUS

Ralph F. Anderson, 332 Calvin Park Blvd., Rockford, Ill. 61107

Filed May 19, 1975, Ser. No. 578,903

Int. Cl.[2] B65H *3/44*

U.S. Cl. 221—93 **9 Claims**



1. An adjustable multiple container dispensing apparatus for simultaneously dispensing a number N of circular containers having a marginal rim from N stacks of nested containers where N is a number no less than 2 comprising: a support and first and second horizontal frame members mounted on said support for relative adjustment laterally toward and away from each other, a first set of N+1 rotary cam members and a second set of N+1 rotary cam members respectively mounted on the first and second frame members for rotation about upright axes, the axes of the first set of rotary cam members being located in a first row at a preselected uniform spacing along the first frame member and the axes of the second set of cam members being located in a second row paralleling the first row at said preselected uniform spacing along the second frame member, each cam member of the first set being aligned in a direction perpendicular to said rows with a respective one of the cam members of the second set to define N+1, transverse pairs of cam members and N container dispensing throats each intermediate adjacent ones of said transverse pairs of cam members, means for simultaneously turning each of the cam members of both said first and second sets between a first angular position and a second angular position, the cam members at the ends of each set each having at least one container support and separating means at an angular location to extend inwardly of the container dispensing throat adjacent thereto and the cam members intermediate the end of each set each having two container support and separating means at angularly spaced locations to extend inwardly of a respective one of the two adjacent container dispensing throats, the container support and separating means being operative to support the lowermost container in a stack when in their first angular position and to separate and discharge the lowermost container and support the next adjacent container in the stack when moved to their second position, and stack guide means defining N container magazines each individual to a respective one of the container dispensing throats, and means for laterally adjusting said first and second frame members to adjust the size of the container dispensing throats defined by the first and second sets of cam members.

3,958,721

COLLAPSABLE TUBE

Hideo Kushida; Yoshio Hara; Toshie Tanaka, and Takeshi Itakura, all of c/o Yoshino Kogyosho Co., Ltd., 2-6, Oojima 3-chome, Koto, Tokyo, Japan

Filed Jan. 15, 1973, Ser. No. 323,982

Claims priority, application Japan, Jan. 18, 1972, 47-8656[U]

Int. Cl.[2] B65D *35/10*

U.S. Cl. 222—107 **22 Claims**

1. A collapsable container made of plastic comprising:

a body comprising a tube with a lap joint, the wall of said tube being laminated and including an outer first water-resisting layer, an adjacent printable layer, an intermediate layer of a material selected from the group consisting of polyvinyl alcohol and an ethylene-vinyl alcohol copolymer, and an inner second water-resisting layer in the order named, the edge of said laminated wall inside said tube and adjacent said lap joint having a water-resistant deposit thereon to seal said inner edge;

a head joined to one end of said body;

a neck extending outwardly from said head, said neck being adapted to receive a closure member;

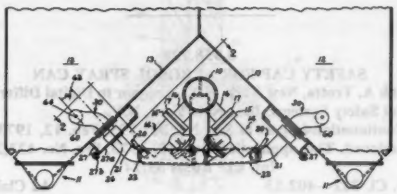
whereby substances may be confined within said plastic container and protected from degradation caused by exposure to the atmosphere and by loss of volatile ingredients.

3,958,722

SELF INDEXING ELBOW

Richard H. Dugge, St. Louis, and Dallas W. Rollins, St. Charles, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Nov. 20, 1974, Ser. No. 525,492
Int. Cl.² B65G 3/12
U.S. Cl. 222—195 21 Claims



1. Apparatus for assisting in the unloading of a difficult to unload lading comprising: a vessel adapted to contain said lading; an accumulator mounted adjacent said vessel; a first conduit connecting said accumulator with valve means for periodic discharge of said accumulator; a self-indexing elbow mounted on said vessel; a second conduit connecting said valve means with said elbow; said elbow comprising an elbow conduit portion in fluid communication with said second conduit; said elbow conduit portion being rotatably mounted in operative relation to the vessel and extending within the vessel and having a conduit center line defining an axis about which said elbow is rotatable; said elbow conduit portion having integral therewith an elbow portion having an elbow center line passing therethrough; said elbow center line intersecting said axis and making an angle therebetween within the range of about 45 and 135°; said axis and said elbow center line adjacent their intersection defining an elbow center line adjacent their intersection defining an elbow plane; said elbow portion having a discharge end having a discharge opening therein through which said elbow center line passes; said elbow center line at said discharge end making an angle with respect to said plane, and being offset with respect to said axis so as to define a moment arm between the elbow portion and said axis; means for pressurizing said accumulator with gas sufficient to dislodge bridged or clogged lading in the vessel and sufficient to cause said elbow to rotate relative to said axis; a bearing assembly mounted between said elbow conduit portion and at least one of said vessel and said second conduit, said bearing assembly having a frictional force sufficient to limit rotation of said elbow with respect to said vessel, whereby a release of pressurized gas by said valve means from said accumulator will cause said gas to pass through said second conduit into said elbow and discharge from said discharge opening into said vessel with a thrust sufficient to cause said elbow to rotate with respect to said axis, the frictional force in said bearing assembly being sufficient to cause the rotation to cease at a new angular position relative to said axis prior to the next discharge of pressurized gas from said accumulator.

3,958,723

AUTOMATIC VOLUME CONTROL FOR CENTRIFUGAL PUMPS

Martin Stähle, Postfach 12, 8213 Neunkirch, Switzerland

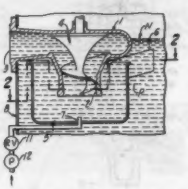
Filed Apr. 23, 1975, Ser. No. 570,767
Claims priority, application Switzerland, Apr. 25, 1974, 005645/74
Int. Cl.² G01F 11/06
U.S. Cl. 222—282 7 Claims

1. A device for regulating the delivery from a constant speed centrifugal pump disposed for rotation about a vertical axis with its inlet end arranged for upward flow of liquid into the pump from a body of liquid, said device comprising:

a. a cylindrical tank member open at its upper side and defining a marginal rim;

b. said tank member adapted to be disposed below the maximum surface level of the body of liquid;

c. the lower portion of the pump, including the inlet and being disposed within the tank member below the marginal rim and concentric therewith;



d. said pump, when the surface level of the body of water is above the marginal rim, causing radial movement of liquid over the rim of the tank member to the pump inlet end;

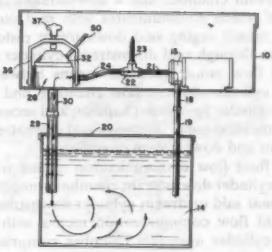
e. said pump, when the liquid in the tank member is isolated from the body liquid, causing rotational movement of the liquid and producing a vortex preventing discharge of liquid from the tank through the pump.

3,958,724

PRESSURE REGULATOR FOR SPRAY SYSTEMS

Richard S. Ordway, Haverhill, Mass., assignor to Circle Machine Co., Inc., Seabrook, N.H.

Filed Sept. 9, 1974, Ser. No. 504,026
Int. Cl.² B05B 1/30
U.S. Cl. 222—318 13 Claims



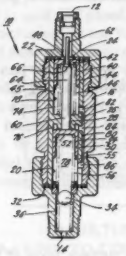
1. Apparatus for delivering liquid under pressure from a container to a sprayer, said apparatus comprising a delivery conduit including a pump, the intake end of said conduit disposable in the container, said delivery conduit including first and second branches, the first branch the delivery branch and the second branch including a discharge disposable in said container and a pressure regulator between said discharge and said first branch, said regulator including a valve in control of the liquid flow through said second branch, means yieldably urging said valve into its open position, means operable to oppose said opening means, one of said means being adjustable to enable, when said pump is in operation, said valve to be so positioned as to establish a desired liquid pressure in said first branch and a flow through the discharge, the pressure remaining substantially constant whether or not the sprayer is in service but the volume of liquid circulating through the regulator varying inversely with the flow through the first branch.

3,958,725

METERING VALVE FOR LUBRICATION INJECTOR

Paul H. Reeve, River Vale, N.J., assignor to Auto Research Corporation, Rochelle Park, N.J.

Filed Oct. 15, 1974, Ser. No. 514,960
Int. Cl.² F16N 23/00
U.S. Cl. 222—335 8 Claims



1. An injector for grease, or the like fluid comprising:

an inlet, an outlet, an upstream cylinder communicating with said inlet, and a separate downstream cylinder communicating with said outlet; said upstream and said downstream cylinders having respective upstream and downstream ends; said first and second cylinder being generally aligned between said injector inlet and said injector outlet;

an upstream piston in and sealingly movable through said upstream cylinder and dividing that said cylinder into an upstream chamber that communicates with said inlet and a downstream chamber; first biasing means urging said upstream piston to return upstream through said upstream cylinder;

a downstream piston in and sealingly movable through said downstream cylinder and dividing that said cylinder into an upstream chamber and a downstream chamber, the latter of which communicates with said outlet; second biasing means urging said downstream piston to return upstream through said downstream cylinder;

first fluid flow communication means between said upstream cylinder downstream chamber and said downstream cylinder upstream chamber, and second fluid flow communication means between said downstream cylinder upstream and downstream chambers;

said first fluid flow communication means with said upstream cylinder downstream chamber comprises a second outlet near said upstream cylinder downstream end; said first fluid flow communication means with said downstream cylinder upstream chamber comprises a second inlet at said downstream cylinder upstream end; and said first fluid flow communication means further comprises a first conduit joining said second inlet and second outlet;

said second fluid flow communication means with said downstream cylinder downstream chamber comprises a third inlet somewhat upstream of said downstream cylinder downstream end; said second fluid flow communication means with said downstream cylinder upstream chamber comprises a third outlet at said downstream cylinder upstream end; said second fluid flow communication means further comprises a second conduit joining said third inlet and said third outlet;

actuating means joining said upstream and downstream pistons for causing joint motion of said pistons in the downstream direction through their respective said cylinders;

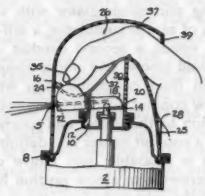
said actuating means comprises an actuator rod that is attached to and movable with said downstream piston and that extends through said upstream piston; an opening through said upstream piston through which said actuator rod passes, which said upstream piston opening is wider than the section of said actuator rod that is passing therethrough thereby to permit grease to pass through that said opening; a shoulder on said actuator rod which said shoulder is positioned downstream of said upstream piston to be engaged by said upstream piston upon downstream motion of said upstream piston, thereby to shift said downstream piston downstream along with downstream motion of said upstream piston.

3,958,726

SAFETY CAP FOR AEROSOL SPRAY CAN

Frank A. Trotta, New York, N.Y., assignor to Digital Differential Safety Systems, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 331,795, Feb. 12, 1973, abandoned. This application Dec. 10, 1973, Ser. No. 423,262
Int. Cl.² B65D 83/14
U.S. Cl. 222—402.13 12 Claims



1. A safety cap for an aerosol can comprising:

a tunnel having a floor and ceiling and having one end open to the exterior and an internal opening at the end remote from the end open to the exterior which tunnel extends diagonally across the safety cap and is configured to afford passage by an adult's finger to the internal opening therein, but prevent passage by a child's finger to the internal opening therein;

said floor having an elevated portion disposed intermediate the ends of the tunnel, the top of which elevated portion is located above the tunnel internal opening and above the lowermost portion of the tunnel exterior opening and is a distance from the tunnel internal opening which distance is the length of an adult's index finger from the second joint to the first joint;

means for rendering the tunnel end open to the exterior and the tunnel internal opening out-of-line of sight;

an outer surface confined substantially within the space defined by an extension of the cylindrical surface of the aerosol can;

an actuation assembly for actuating the aerosol can valve, which actuation assembly has a pressure surface at the internal opening in the tunnel;

a fluid passage in the actuation assembly having a frontal discharge opening, which fluid passage extends from a location on the actuation assembly which bears on the valve stem of the aerosol can to the frontal discharge opening;

a discharge opening in the safety cap arranged for alignment with the discharge opening in the actuation assembly when the actuation member has been depressed to actuate the aerosol can valve; and

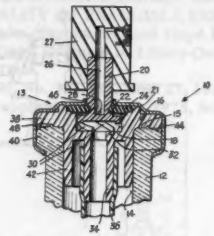
means to mount the safety cap on an aerosol can.

3,958,727

AEROSOL DISPENSER CONSTRUCTION

Wolf Steiman, Bridgeport, Conn., assignor to VCA Corporation, Greenwich, Conn.

Filed Oct. 29, 1974, Ser. No. 518,790
Int. Cl.² B65D 83/14
U.S. Cl. 222—402.24 1 Claim



1. A valve construction for an aerosol dispenser comprising in combination:

a. a container having a neck portion with a cylindrical inner wall defining an upper opening which terminates in an annular rim having an external annular shoulder lying below the rim;

b. an integrally formed valve housing including a valve chamber having a central opening at its upper and lower ends, an integral nipple surrounding the lower opening and depending from the bottom of the valve chamber, an annular mounting flange extending outwardly from the upper portion of the chamber and sealingly seated on the rim, an annular skirt depending from the underside of the mounting flange coaxial with and spaced from the nipple and extending below the valve chamber and making sealing engagement with the cylindrical inner wall of the neck portion of the container;

c. a resilient annular valve seat having a central aperture and constituting the top wall portion of the valve chamber;

d. a valve stem having a hollow shank portion extending through the aperture of the valve seat, and futher having an annular valve shoulder disposed in the valve chamber and engageable with the valve seat to close off the aperture thereof;

e. said valve stem having a side opening disposed adjacent the shoulder and communicating with the hollow of the shank portion;

f. spring means biasing said shoulder into engagement with said seat; and

g. a ferrule crimped over the external annular shoulder of the container so as to hold captive the valve seat and valve housing, said ferrule having a central opening for receiving the hollow shank portion of the valve stem.

3,958,728

ORTHOPEDIC BANDAGE CORE

Louis F. Nienart, Elizabeth, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

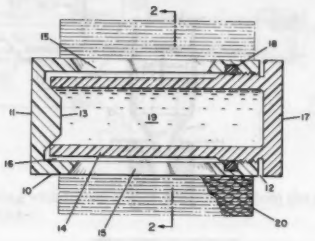
Filed June 24, 1974, Ser. No. 482,529
Int. Cl.² B65D 41/04
U.S. Cl. 222—519 10 Claims

1. A fluid dispenser comprising:

a. a housing having a closed end, an opposite open end and fluid release opening means extending through the wall of said housing;

b. an inner member adapted to store a fluid and having one open end, an opposite closed end, a length substantially coextensive with the length of said housing and an outside cross-sectional dimension smaller than the inside cross-sectional dimension of said housing; said open end of said inner member being insertable in said open end of said housing thereby providing an annular space between the wall of said housing and said inner member;

c. said open end of said inner member being engageable with said closed end of said housing so as to form a first releasable sealing means to contain said fluid in said inner member; and



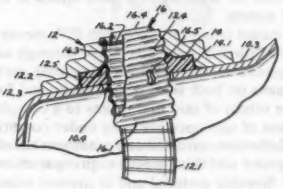
d. means provided on said inner member adjacent its closed end and engageable with means provided on said housing adjacent its open end so as to form a second releasable sealing means, the portion of said inner member extending from said open end of said inner member to said means adjacent the closed end of said inner member being adapted to store said fluid.

3,958,729

CONTAINER WITH REVERSIBLE DISPENSER

Edward J. Martin, 5921 Oliver Ave. South, Minneapolis, Minn. 55419

Filed Aug. 16, 1974, Ser. No. 497,951
Int. Cl.² B67D 5/00
U.S. Cl. 222—539 13 Claims



1. A container with a dispenser having reversible closure and pouring positions, the dispenser comprising:

a collar mounted to a wall of the container and having an internally threaded bore open to the container interior, the collar holding and restraining an internal, deformable, annular gasket extending normally radially inwardly slightly of the threads of the bore; and

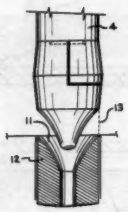
an elongated, hollow dispensing spout having an open end and a closed end with a side opening in the spout spaced from the closed end, the spout having an exteriorly threaded surface portion free of obstructions and adjacent its closed end for threading the spout from either end into the collar bore with the threaded surface portion of the spout extending a sufficient distance on each side of the side opening so as to sealingly engage and deform the annular gasket held by the collar with the side opening of the spout open to the container interior in both the closed and pouring positions.

3,958,730

STOPPER PLUG FOR BOTTOM POUR LADLES

Robert A. Caldwell, 13593 Rose, Gibralter, Mich. 48173

Filed Sept. 13, 1974, Ser. No. 505,666
Int. Cl.² B22D 41/10
U.S. Cl. 222—559 8 Claims



1. An apparatus for selectively opening and closing an aperture in a surface of a receptacle for flowable material, comprising, in combination:

first means for mating with said aperture and for selectively moving in a predetermined direction substantially perpendicular to a plane containing the line of intersection between said aperture and said surface of said receptacle to open and close said aperture;

second means for moving said first means and being detachably connectable to said first means;

said second means being provided with projection means which is insertable into said first means in a direction substantially perpendicular to said predetermined direction so that at least a portion of said projection means is surrounded by said first means;

third means for mating with said first and second means and for surrounding a portion of said projection means;

said first and third means completely surrounding said projection means;

fourth means for securing said third means to said first and second means;

said first means being provided with fifth means for permitting said flowable material to flow through said aperture in its opened condition while maintaining portions of said first means on both sides of said plane and for insuring a positive return of said first means to a completely closed condition of said aperture even under conditions of warpage, deflection, errosion and misalignment of any of said first, second and third means to prevent undesirable flow of said flowable material and to prevent misalignment of said first means with said aperture;

said second and third means including sidewalls which are disposed in planes that radiate from the longitudinal axis of said second means;

said fifth means including a plug surface having a slightly concave conical generated shape;

protective sleeve means disposed around the portions of said second means which project out of said first and third means;

said sleeve means being provided with an annular projecting extension;

said first and third means being provided with an annular concave seating groove into which said annular projecting extension fits to lock said first and third means together and to solidify said apparatus; and

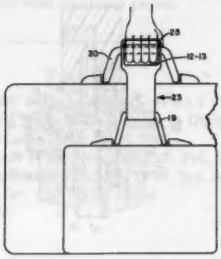
at least a portion of said first and third means is provided with a tapered outer surface which contacts said line of intersection between said aperture and said surface of said recpetacle when said apparatus is in said closed condition.

3,958,731

LUGGAGE HANDLE EXTENSION HANDLE

Robert D. Riedle, Okemos, Mich., assignor to Third Arm. Inc., Vandalia, Ill.

Filed Sept. 23, 1974, Ser. No. 508,151
Int. Cl.² B65D 71/00
U.S. Cl. 224—58 13 Claims



8. Handle extension to facilitate carrying a plurality of articles having handles, and comprising:

a hand-receiver loop portion;

a strap portion having one end permanently connected to said loop portion and having its other end insertable through handles of articles to be carried and then closable for temporary attachment to said loop portion for carriage of one or more articles whereby, when the handles of one or more articles having handles to be carried are encircled by the strap portion, the loop portion may be grasped together with the handle of another article to provide a single grip for carrying a plurality of articles,

the other end of said strap portion being without a permanent hand-receiver loop portion, and

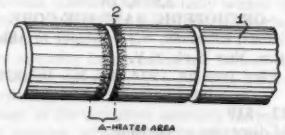
latch means on said strap portion adjacent said other end thereof and engageable with the one end of said strap portion to retain said strap portion in article handle encircling condition, said strap portion extending between said loop portion and said latch means and having a reduced width slightly less than the width of said loop portion to preclude shifting of the handle of the article carried by said reduced width.

3,958,732

METHOD FOR BREAKING STEEL ROD INTO BILLETS

Shigetsune Aoyama, Okazaki; Masahiko Kato, Aichi; Motoo Matsubara, Kasugai, and Osamu Furuta, Tokai, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho and Aichi Steel Works, Ltd., both of, Japan

Filed Dec. 13, 1974, Ser. No. 532,732
Claims priority, application Japan, Dec. 15, 1973, 48-4050
Int. Cl.² B26F 3/00
U.S. Cl. 225—2 19 Claims



1. A method for breaking a steel rod into billets comprising the steps of:

forming a circumferential notch in the surface of the steel rod, locally heating the surface areas of the steel rod adjacent such notch so that the surface of the rod at the bottom of the notch is at a temperature less than that at which transformation of ferrite to austenite occurs,

quenching the rod to thereby develop a crack extending from the bottom of said notch toward the center of the rod, and

applying a mechanical load to break the rod along said circumferential notch.

3,958,733

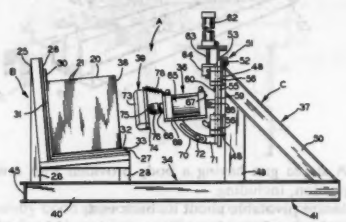
METHOD FOR SIMULTANEOUSLY BREAKING A PLURALITY OF FRANGIBLE SHEETS

Raymond L. Landes, Perrysburg, and Floyd F. Le Gros, Toledo, both of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Division of Ser. No. 391,887, Aug. 27, 1973, Pat. No. 3,883,056. This application Jan. 27, 1975, Ser. No. 544,424

Int. Cl.² B26F *3/00*

U.S. Cl. 225—2 **6 Claims**



4. In a method for breaking and separating a plurality of individually scored frangible sheets stacked one against another with their scored line in superimposed relation into two units comprising the steps of:

a. supporting the stack of frangible sheets in their superimposed relation so that the stack can deflect at the score lines;

b. applying an initial force at a line parallel to and spaced from said score lines to deflect and break some of the sheets in the stack;

c. releasing the initial force;

d. allowing the broken sheets to separate when the initial force is released;

e. applying a second force at said line parallel to and spaced from the score line to deflect and break the balance of the sheets in the stack; and

f. allowing the balance of the broken sheets to separate when said second force is released whereby the stack of frangible sheets is broken and separated into two units in two stages.

3,958,734

APPARATUS AND METHOD FOR CONTROLLING THE INVENTORY OF THE YARN MASS WITHIN A CONFINED SPACE

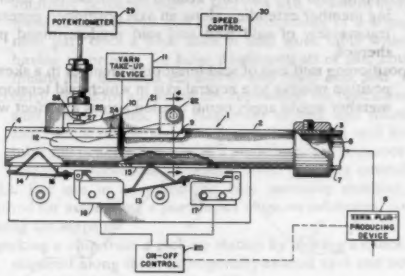
Roger H. Fink, and William D. Porter, both of Asheville, N.C., assignors to Akzona Incorporated, Asheville, N.C.

Filed Oct. 24, 1974, Ser. No. 517,786

Int. Cl.² D02G *1/12*

U.S. Cl. 226—1 **19 Claims**

1. An apparatus for controlling the inventory of a mass of compacted yarn within a confined space which comprises a yarn mass guide means including a cylindrical wall portion defining a yarn mass accumulation chamber for guiding and confining the yarn mass therein, an inlet opening means for permitting delivery of the yarn mass into one end of the accumulation chamber, and an outlet opening means for withdrawal of the yarn in the form of a yarn bundle from the accumulation chamber; first yarn sensing means for establishing a high yarn mass level and a low yarn mass level within said chamber for controlling the delivery of the yarn mass and second yarn sensing means responsive to the position of the yarn mass between said high and low yarn mass levels for



monitoring withdrawal of the yarn bundle from the accumulation chamber.

3,958,735

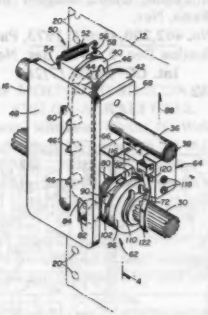
METHOD AND APPARATUS FOR DETECTING PAPER DRIVE MALFUNCTIONING IN AN AUTOMATIC PRINTER

Robert R. Wanat, Park Ridge, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Feb. 18, 1975, Ser. No. 550,382

Int. Cl.² B65H *25/02*

U.S. Cl. 226—1 **17 Claims**



16. A method for sensing a malfunction in the movement of a paper web through an automatic printer comprising the steps of:

positioning a first cam in relation to the desired movement of the paper;

positioning a second cam in relation to the actual movement of the paper;

sensing the relative positions of the first and second cams and providing a signal in response to a predetermined condition; and

interrupting the paper drive mechanism in response to said predetermined condition.

3,958,736

WEB TENSIONING AND STEERING

Robert M. Pounds, Bogalusa, La., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Nov. 6, 1974, Ser. No. 521,506

Int. Cl.² B65H *23/02, 25/26*

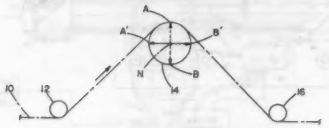
U.S. Cl. 226—3 **13 Claims**

1. The method of tensioning one side of a web as it is moved in a predetermined path and simultaneously correcting steer-

ing error caused by said tensioning tending to direct said web transversely away from said path, comprising the steps of:

wrapping said web partially around the surface of a tensioning member extending along an axis positioned generally transversely of said web and said predetermined path thereof;

positioning said axis of said tensioning member in a skewed position relative to a neutral axis in which said tensioning member would apply equal tension across a perfect web,



with one end of said tensioning member, at the side of said web to be tensioned, positioned, relative to the other end of said tensioning member, a first distance toward the portion of said web wrapped around said tensioning member surface and forward a second distance equal to said first distance in the direction of movement of said web in said predetermined path; and

moving said web past said tensioning member in said predetermined path.

3,958,737

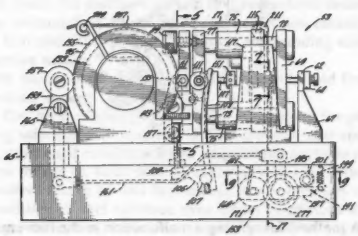
ADJUSTABLE FEED MECHANISM

Eldred D. Scott, Tustin, Calif., assignor to Precision Sales Corporation, Reno, Nev.

Division of Ser. No. 402,290, Oct. 1, 1973, Pat. No. 3,863,534. This application Dec. 9, 1974, Ser. No. 530,650

Int. Cl.² B65H *17/26*

U.S. Cl. 226—142 **5 Claims**



1. A feeding mechanism for feeding material to a machine comprising:

a supporting structure;

a drive roll rotatably mounted on the supporting structure;

a second roll rotatably mounted on the supporting structure, said rolls being adapted to receive the material therebetween;

a drive lever;

means for mounting the drive lever for pivotal movement in both directions about a pivotal axis;

one-way clutch means for coupling said lever to said drive roll so that said lever drives said drive roll when the lever is pivoting in one of said directions about said pivot axis and does not drive the drive roll when the lever is pivoting in the other of said directions about said pivot axis whereby the rolls can cooperate to index the material;

a adjustable stop mounted on the supporting structure for limiting the pivotal movement of said drive lever in said one direction whereby the amount of the material which is indexed is controlled; and

resilient means for driving said drive lever in said one direction.

3,958,738

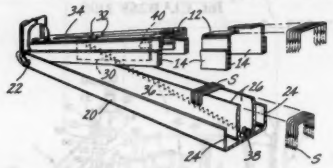
STAPLE GUN FOR ACCOMMODATING A RANGE OF STAPLE SIZES

Raymond M. Tremblay, Whitman, Mass., assignor to USM Corporation, Boston, Mass.

Continuation of Ser. No. 516,105, Oct. 18, 1974, abandoned. This application Nov. 13, 1975, Ser. No. 631,613

Int. Cl.² B25C *5/06*

U.S. Cl. 227—109 **5 Claims**



1. A staple gun having a body provided with a magazine base portion, including:

a closure pivotable about its back end;

a mechanism for reciprocably operating a driver at the front end of said gun for acting on successive foremost staples aligned therewith;

a slider having spaced parallel walls movable in said magazine base portion for urging staples having the widest leg spacing of a range of staple sizes successively into the path of said driver to be driven thereby; and

a pair of parallel staple supporting guide rails upstanding from said closure and extending toward its free end, said guide rails being spaced to accommodate the smallest leg spacing of a range of staple sizes while being equidistant from the walls of said slider, said slider also including on its forward end inwardly projecting portions extending substantially to each guide rail for providing uniform sliding pressure to any width staple encountered therewith.

3,958,739

WELD CENTERING WORKPIECE HOLDER

Charles David Wicker, Indianapolis; Donald Louis Tucher, Mooresvill, and Charles Dewey Christie, Indianapolis, all of Ind., assignors to Wallace-Murray Corporation, Indianapolis, Ind.

Filed June 18, 1975, Ser. No. 587,973

Int. Cl.² B23K *15/00, 37/04*

U.S. Cl. 228—44.1 R **9 Claims**

1. A workpiece holder assembly for positioning a hub element such as a turbine with respect to a shaft end such as a turbine shaft in aligned and abutting relation, said holder including,

a. a lower base plate having a central recess extending therethrough,

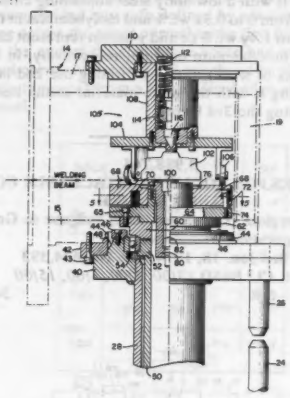
b. the said central recess having means receiving and supporting a vertically disposed turbine shaft, the upper end of the shaft being adapted to be welded to one face of a turbine,

c. an upper base plate parallel to and coaxially disposed with relation to said lower base plate,

d. means for normally holding said upper base plate spaced from said lower base plate, against the force of gravity,

e. a centering recess centrally of said upper base plate, said recess adapted to receive a turbine whose axis of rotation is vertically disposed and coaxial with the longitudinal axis of a turbine shaft,

f. the upper end of a turbine shaft which is to be welded to a turbine adapted to be positioned below the top surface of the upper base plate in the normal position of the upper and lower base plates relative to each other,



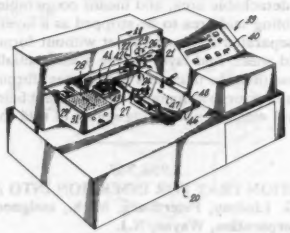
g. whereby upon depression of the upper base plate relative to the lower base plate a sufficient distance, the top of the upper base plate is adapted to move to a position below the top of a turbine shaft and an impeller is adapted to abut against the upper end of an impeller shaft.

3,958,740

AUTOMATIC COMPONENT ASSEMBLY MACHINE AND METHOD RELATING THERETO

Kenneth K. Dixon, Rancho Palos Verdes, Calif., assignor to Dixon Automation, Inc., Torrance, Calif.

Filed July 8, 1974, Ser. No. 486,520
Int. Cl.² H01L *21/58*
U.S. Cl. 228—102 **17 Claims**



1. In a programmable manipulator for the sequential placement of a plurality of component parts on a work-piece, the combination comprising:

a pickup station, including means for feeding the component parts;

an assembly station including a work table for supporting at least one work-piece;

chuck means for releasably holding a component part for transfer from said pick-up station to said assembly station;

means for moving said chuck means rapidly along a first axis between said pick-up station and said assembly station;

means for moving said chuck means along second and third axes generally orthogonally related to said first axis;

means for rotating said chuck means about one of said three axes;

means for moving said work table along a fourth axis substantially perpendicular to said first axis, whereby movement in said fourth axis allows positioning of a component part over a wide area of said work table without having to provide for large displacements of said chuck means in a direction parallel to said fouth axis; and

control means for automatically controlling the operation of said chuck means, said means for moving and rotating said chuck means and said means for moving said work table, all in accordance with a predetermined sequence of steps selectable and adjustable under operator control.

13. For use in an automatic chip assembly machine, a method for assembling a plurality of chips on substrates, comprising the steps of:

picking a chip from a pick-up station by moving a chuck as required along three orthogonally-related axes and actuating the chuck to grip the chip;

raising the chip from the pick-up station;

moving the chip rapidly along a horizontal axis to a desired position on a work table supporting the substrate;

positioning the chip with respect to the substrate by lowering the chuck and moving the substrate table along a transverse horizontal axis;

releasing the chip;

performing manual positional adjustments at each of said aforementioned steps;

repeating said aforementioned steps in order to place a plurality of chips on the substrate at different desired positions; and

automatically repeating said foregoing steps, except for said step of performing manual positional adjustments, as many times as desired to produce a plurality of substrate assemblies.

3,958,741

METHOD OF MOUNTING SILICON ANODES IN A CHLOR-ALKALI CELL

Harlan B. Johnson, Rittman; Cletus N. Welch, Clinton, and Aleksandrs Martinsons, Wadsworth, all of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 4, 1974, Ser. No. 447,708
Int. Cl.² B23K *31/02*
U.S. Cl. 228—122 **9 Claims**

1. A method of mounting a solid silicon member in a lead member mounted on a cell base, said silicon member extending outwardly from and supported by said lead member, comprising:

providing a solid lead layer having an aperture corresponding to and complimentary to a base of said silicon member;

placing the base of the silicon member in said aperture;

adding molten lead to the aperture to provide molten lead around the base of the silicon member in an amount less than 2.0 parts of molten lead by volume per part of silicon immersed in the lead by volume; and

allowing said molten lead to cool and solidify.

3,958,742

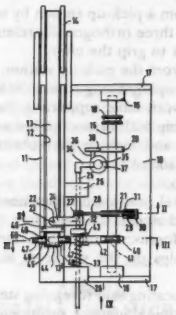
MANUFACTURE OF SUPPORTS FOR SEMICONDUCTOR DEVICES

Geoffrey Howarth, Oldham, and Sydney Jackson, Hayfield, both of England, assignors to Ferranti, Limited, Hollinwood, England

Filed Nov. 19, 1974, Ser. No. 525,201
Claims priority, application United Kingdom, Nov. 24, 1973, 54644/73
Int. Cl.² H01L *21/58*
U.S. Cl. 228—123 **2 Claims**

1. Apparatus for manufacturing supports for semiconductor devices comprising means to feed a tape, means to sever the tape into pieces, means to hold individually and temporarily

each severed piece of tape, and means to secure the severed pieces of tape to selected parts of support members of supports, the tape being of a material suitable to bond semiconductor devices to the selected parts of the support members, the length of each severed piece of tape, in relation to the width and thickness of the supplied tape, being arranged to be such that the dimensions of the severed piece are sufficient to bond a semiconductor device to a support member, the feeding means including a reciprocatable dog to feed the tape towards the severing means in a positive manner with an intermittent motion, the dog engaging the tape in each repetitive forward movement of the tape towards the severing means, in each intervening period between repetitive forward movements of the tape the dog both being disengaged from



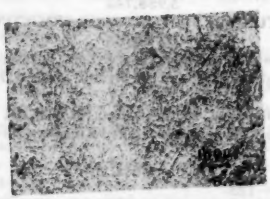
the tape and being moved on the reverse part of the stroke of its reciprocating action, the stroke length of the reciprocating action of the dog determining the length of each severed piece of tape, the dog comprising a needle mounted with its longitudinal axis substantially normal to the plane in which the tape is fed to the severing means, and having only a point contact with the tape during the forward movement of the tape toward the severing means, and the holding means being arranged both to remove each tape piece from the severing means in the intervening period between the corresponding forward movement of the tape and the next such forward movement, and to transfer the severed piece of tape to the selected part of the support member, where the tape piece is released by the holding means.

3,958,743

WELDING PROCESS FOR ALUMINUM OR CHROME DIFFUSION-COATED STEEL

Kunio Ishii, Yokohama; Masao Izumiyama, Zushi, and Keikichi Maeda, Yokohama, all of Japan, assignors to Japan Gasoline Co., Ltd., Tokyo, Japan

Filed July 7, 1975, Ser. No. 593,209
Claims priority, application Japan, July 22, 1974, 49-83243
Int. Cl.² B23K *5/10, 35/30*
U.S. Cl. 228—226 **5 Claims**



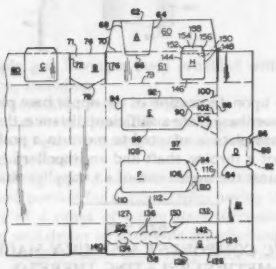
1. In the multi-layer butt welding process for a coated steel produced by forming a diffusion coating of aluminum or chromium on the surface of a chromium-molybdenum steel as the base metal, a multi-layer butt welding process which comprises: first welding the diffusion coating side of said coated steel with a ferritic stainless steel containing chromium in the range of from 15 to 26 wt.%, thereby forming the 1st layer; next welding it with a low-alloy steel containing chromium in the range of from 0 to 0.3x wt.% and molybdenum in the range of from 0.4y to 1.4y wt.% (*x* and *y* herein represent chromium content and molybdenum content, respectively, in the base metal in terms of wt.%), thereby forming the 2nd layer, and further welding it with the same material as the base metal, thereby forming the 3rd layer.

3,958,744

STRUCTURES FOR FORMING DETACHABLE COUPONS AND THE LIKE

Harald J. Herglotz, Tuscaloosa, Ala., assignor to Gulf States Paper Corporation, Tuscaloosa, Ala.

Filed Jan. 18, 1974, Ser. No. 434,393
Int. Cl.² B65D *13/00, 1/00, 5/00, 15/00*
U.S. Cl. 229—6 R **34 Claims**



1. A structure for providing a sheet of material with a coupon or the like constituted by a manually detachable surface area within a predetermined perimeter, the structure comprising means including a cut in said sheet to a depth less than the thickness of the sheet for defining at least part of the perimeter of said detachable area, and means cooperable with said cut for enabling said area to be stripped as a layer from said sheet and separated from said sheet without forming a hole through said sheet, said layer having a substantially uniform thickness less than the thickness of said sheet throughout said area, said area prior to stripping from said sheet being substantially integral with the underlying region of said sheet.

3,958,745

PARTITION TRAY FOR INSERTION INTO A BOX

La Vern G. Lindsay, Petersburg, Mich., assignor to Union Camp Corporation, Wayne, N.J.

Filed July 28, 1975, Ser. No. 599,924
Int. Cl.² B65D *3/24, 5/48*
U.S. Cl. 229—15 **6 Claims**

1. A one sheet generally rectangular blank adapted for folding into a partition tray having rows and columns of cells comprising:

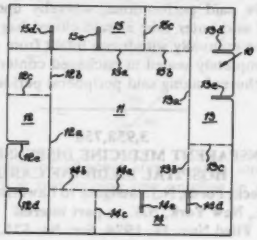
a generally rectangular bottom panel; and

four generally rectangular cell panels forming a frame around the said bottom panel;

two opposite of said cell panels having a length equal to the length of a row of cells plus the length of the side of one cell and the other two of said cell panels having a length equal to the length of a column of cells plus the length of the side of one cell;

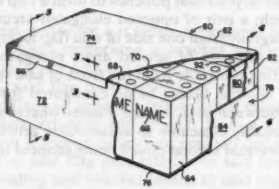
each of said cell panels

a. having a width equal to the desired height of the cells;
b. being connected at a corresponding corner of the said cell panel to a different but corresponding corner of the said bottom panel along a first hinge score line extending from the said corner of the said cell panel a distance equal to the length of a side of a said cell; and
c. being divided into cells defined by a second hinge score line across the panel normal to the first hinge score line at the end of the first hinge score line away from the said corner of the said cell panel and by slots extending into the panel from a longitudinal edge of the said cell panel;



the said two opposite of the said cell panels being adapted to be folded along the said hinge score lines over the bottom panel to form the walls of the rows of the said cells and the other two of said cell panels being adapted to be folded along the said hinge score lines over the bottom at right angles to the two opposite cell panels to form the walls of the columns of the said cells;
the said slots of the said cell panels being so cut that they will permit the said cell panels to fit together and interlock with each other at the lines of intersection of the said cell panels.

3,958,746
SPECIAL SHIPPING CASE FOR ELIMINATION OF CUT CONTAINER CONTENTS
Charles J. Wilbur, Barrington, Ill., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 27, 1975, Ser. No. 553,564
Int. Cl.² B65D *5/08*
U.S. Cl. 229—38 **3 Claims**



1. A shipping assembly comprising a corrugated paperboard shipping case having a plurality of containers packed therein; said containers having indicia imprinted thereon whereby one face of the respective containers is characterized as a respective top thereof; said containers being positioned within said case so that the respective tops of the containers underlay the top panel of the case; said case having ends thereof comprising a pair of minor end flaps hinged along edges of the body of the case which are substantially perpendicular with respect to said top panel; said minor end flaps having relatively narrow separator strips secured thereto, extending along the top edge of said minor end flaps; said top panel of said shipping case having flaps dependent from along at least three edges thereof; said flaps being unattached to the body of the case in a cutting zone along the entirety of said edges of said top panel, said flaps being secured to the body of the case below said zone.

3,958,747
TAMPERPROOF CONTAINERS
Douglas Frank Chipp, 3955 Belanger St., E., Apt. 407, Montreal 408, Quebec, and Raymond Delorme, 4481 Gatineau, Chomedey, Laval, Quebec, both of Canada
Filed June 22, 1973, Ser. No. 372,490
Int. Cl.² B65D *43/08*
U.S. Cl. 229—43 **17 Claims**

1. A substantially tamperproof-type container where tampering of said container can be visually determined by bending of a body portion or bending of a strengthening and retaining frame forming part of the container, said container comprising in combination a knock-down body portion forming a cavity to retain a commodity therein, said body portion being of one piece construction formed by a self supporting material and having at least first and second body-forming walls, and each of said body-forming walls having end margins thereon, said body portion having an aperture communicating with said cavity to permit loading of a commodity therein, a first flap extending from the end margin on said first body-forming wall and capable of being struck in a direction where it lies substantially in juxtaposition to the exterior surface of said first body-forming wall, a second flap extending from the end margin on said second body-forming wall and capable of being struck in a direction where it lies substantially in juxtaposition to the exterior surface of said second body-forming wall, closure means operatively associated with said body portion to extend in closurewise position over said aperture, said closure means comprising a strengthening and retaining frame of one piece construction which has a shape substantially conforming to the shape of said body portion, said strengthening and retaining frame having a side wall formed of a reinforcing material, first and second flanges extending inwardly substantially perpendicularly from said side wall and being spaced apart from each other by a distance approximately equal to the length of said first flap, said first and second flaps each having a depth approximately equal to the depth of the side wall of said strengthening and retaining frame, said side wall of said strengthening and retaining frame being substantially parallel to said first and second body-forming walls when said closure means is in the closurewise position, the end margin of said first body-forming wall being operatively retained by the first flange on said side wall and the outer end of said first flap snuggly engaging the second flange on said side wall when said strengthening and retaining frame is assembled with said body portion, said first flange snuggly engaging the end margins of said first and second body-forming walls sufficiently to prevent play or free movement of the strengthening and retaining frame when surrounding the container body portion, the end margin of said second body-forming wall also being operatively retained by the first flange on said side wall when said member is assembled with said body portion, each of said first and second flaps being located in somewhat parallel relationship to said respective first and second body-forming walls but being slightly angularly located with respect to said body-forming walls when the closure means is shifted to the closurewise position, said second flange having a bearing surface which faces the first flange and retentively engaging the outer end of said first flap, said bearing surface having a width substantially greater than the thickness of the outer end

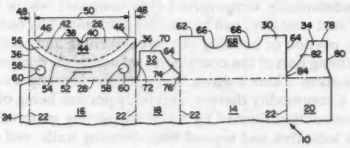
of said first flap, said end margin on said first body-forming wall engaging said side wall and being retained by said side wall and said first flange when said strengthening and retaining frame is assembled with said body portion, said relatively slight angular relationship of said first flap to said first body-forming wall increasing the locking strength of said flap to said strengthening and retaining frame, to thereby provide a positive seal and an extended panel associated with said body-forming walls and which extends at least partially over said aperture and cooperates with said strengthening and retaining frame to facilitate in the closing of said aperture.

3,958,748

RECLOSABLE CARTON

William Andrew Smith, Cheviot, and Richard Eugene Moyer, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 11, 1975, Ser. No. 630,866
Int. Cl.² B65D *5/54, 5/70, 17/00*
U.S. Cl. 229—51 TC **14 Claims**



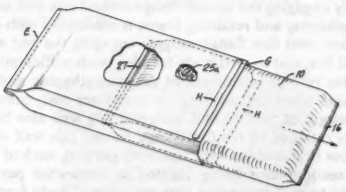
1. In a folded board carton provided at one end with opposed pairs of major and minor flaps, the improvement comprising an elongated concamerated tear out tab extending inwardly of a major extent of the distal edge of the first down major flap leaving a minor portion of said distal edge on each side of said major portion to allow adequate sealing and to keep the carton generally rigid and bulge resistant after opening and wherein the second down major flap is adhered to said first down major flap proximally of said tear out tab substantially only adjacent the concamerated edge thereof; the distal edge of said second down major flap defining a reclosure tab for insertion into a mating slit provided in said first down major flap to enable reclosure thereof after opening.

3,958,749

GUSSETED PINCH BOTTOM BREAKAWAY POUCH BAG

John J. Goodrich, Pensacola, Fla., assignor to St. Regis Paper Company, New York, N.Y.

Continuation-in-part of Ser. No. 460,497, April 12, 1974, Pat. No. 3,910,488, which is a continuation-in-part of Ser. No. 235,908, March 20, 1972, Pat. No. 3,807,626. This application Sept. 2, 1975, Ser. No. 609,521
Int. Cl.² B65D *33/02*
U.S. Cl. 229—55 **12 Claims**



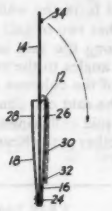
1. A multiwall bag for the sift proof, leak proof and sanitary packaging of particulate and also of moisture containing materials, and for the subsequent uncontaminated withdrawal of the packaged product, said bag consisting essentially in combination of: a pair of inner and outer tubes of, respectively, heat sealable and non-heat sealable, flexible sheet materials; said bag in its assembled condition being open at one end and closed at the other end, said inner tube being lightly bonded to said outer tube at said closed end for manual detachment therefrom, and being heat sealed to closure adjacent said closed end, said outer tube being closed at said end beyond at least a portion of said heat sealed closure of said inner tube, by means for opening the same leaving said inner tube intact; said inner tube being bonded to said outer tube at the open bag end and being peripherally perforated at spaced intervals adjacent said end, the open end of said bag being adapted for closure subsequent to filling, by heat sealing said inner tube to closure below said perforations and thence closed in both said tubes above said perforations, whereby upon subsequent opening of said outer tube at said closed bag end said inner tube may be manually withdrawn intact from said outer tube with its completely sealed in packaged contents by tensional severance thereof along said peripheral perforations.

3,958,750

TRANSPARENT MEDICINE DISPENSER WITH HOSPITAL MEDICINE CARD

Mary Prybeck, Fords, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Nov. 21, 1974, Ser. No. 525,889
Int. Cl.² B65D *31/12*
U.S. Cl. 229—56 **1 Claim**



1. A package for medication to be dispensed according to directions given on a card comprising: first and second back to back open pouches formed by three layers of transparent flexible plastic sheets adhered along three sides thereof, a center one of said sheets being common to said pouches and being extended beyond said pouches to form a flap for closing said first pouch; a pair of opposed elongated arcuate blades projecting integrally from one side of said flap facing said first pouch; and a plurality of spaced apart elongated bulbous blades projecting integrally from the front of said first pouch, each of said bulbous blades being configured for frictional engagement between said arcuate blades whereby said first pouch is adjustably closeable to accomodate articles of various thicknesses; said second pouch being adapted to hold said card therein.

3,958,751

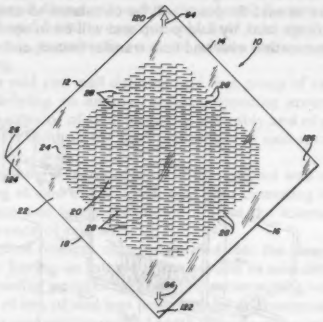
SLITTED PACKAGING APPARATUS

Edward C. Bruno, 1880 S. Monaco, Denver, Colo. 80222

Filed Oct. 17, 1974, Ser. No. 515,655
Int. Cl.² B65D *65/10*
U.S. Cl. 229—87 F **9 Claims**

1. A wrapper for produce and the like which comprises:
a sheet of thin pliable plastic material having the central area thereof cut to define a plurality of generally step-shaped slits, each of said slits including parallel end portions arranged in laterally offset staggered relation to one another and a transversely extending midsection interconnecting the adjacent ends of said end portions in transverse relationship thereto, adjacent ones of said slits

being longitudinally and transversely aligned to define longitudinally and transversely extending rows, and



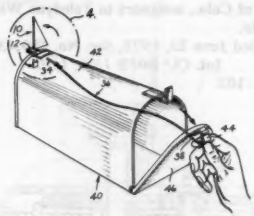
the end portions of adjacent slits in each longitudinally extending row overlapping one another in end-to-end relation.

3,958,752

SIGNAL DEVICE FOR USE IN CONJUNCTION WITH A MAILBOX, NEWSPAPER TUBE, LOCK BOX OR SIMILAR DEVICE

Chester A. Pieszchala, 2005 Mustang Drive, La Porte, Ind. 46350

Filed Jan. 27, 1975, Ser. No. 544,135
Int. Cl.² B65D *91/00*; G08B *5/00*
U.S. Cl. 232—35 **6 Claims**



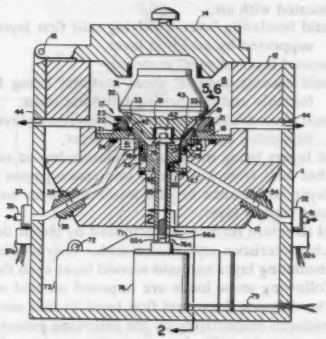
1. A signal device for a mailbox, newspaper tube, lock box or similar object comprising a bracket means, a flag part having an indicator end and an opposite end, means pivotally connecting said flag part between its ends to said bracket means, said flag part opposite end including means for causing said flag part indicator end to shift from a first indicating position into a second indicating position upon free pivotal movement of said flag part relative to said bracket means, means mounting said bracket means to said object with said flag part being positioned exteriorly of said object, said bracket means having an opening therein, said flag part having an opening therein aligned with said bracket means opening when said flag part indicator end is located in its first indicating position, pin means releasably extending into said aligned openings for securing said flag part indicator end into its first indicating position, an actuator cord having one end means connected to said pin and having its opposite end means connected to said object at a selected location, said cord effecting withdrawal of said pin from said aligned openings in response to movement of said selected location relative to said bracket or in response to movement of said cord relative to said selected location to permit said flag part indicator end to shift from its first indicating position to its said second indicating position.

3,958,753

AIR DRIVEN CENTRIFUGE

Douglas H. Durland, Palo Alto; Charles H. Chervenka, Sunnyvale, and Malcolm C. McGilvray, Jr., Palo Alto, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 11, 1975, Ser. No. 567,255
Int. Cl.² B04B *9/06*, *9/14*
U.S. Cl. 233—23 R **21 Claims**



1. In an air driven centrifuge including a rotor chamber housing a rotor seat and a rotor having a plurality of turbine flutes formed in an under side thereof, said rotor seat including driving air jet means for impinging pressurized air streams against said turbine flutes for supporting and spinning said rotor on an air cushion above said rotor seat within said chamber, the improvement comprising:

support air jet means for directing pressurized air streams against an underside of said rotor for supporting said rotor in a non-driving position above said rotor seat when said driving air jet means is inactivated; and

brake and stabilizing means for decelerating said spinning rotor including:

a friction bearing means mounted on a bottom portion of said rotor, and

friction stabilizer means movable into engagement with said bearing means and cooperating with said bearing means to produce a frictional load opposing rotation of said rotor thereby causing said rotor to decelerate and stabilizing said rotor as it reduces from high rotational speed to a stop.

3,958,754

SNOW LOAD REMOVAL

Morton Austin Newcomb, and Johan A. Bjorksten, both of Madison, Wis., assignors to Griffolyn Company, Inc., Houston, Tex.

Division of Ser. No. 388,090, Aug. 14, 1973, Pat. No. 3,908,901, which is a continuation-in-part of Ser. No. 113,904, Feb. 9, 1971, abandoned. This application Nov. 15, 1974, Ser. No. 523,974
Int. Cl.² F24D *3/02*
U.S. Cl. 237—1 R **1 Claim**

1. In a building, means to dispose of snow loads which comprises the combination of:

a roof structure,

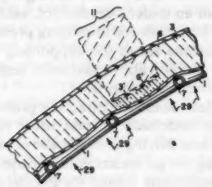
said roof structure extending over a space containing air,

heating means,

said heating means disposed to heat the air in said space to a temperature higher than the melting temperature of snow,

said roof structure characterized by comprising the combination of:

a first layer of sheet material,
said first layer of sheet material being characterized by being flexible and foldable and comprising synthetic resin,
substantially relatively rigid means to support said first layer in relatively substantially fixed position from other portions of the building,
an insulating layer of flexible elastically deformable compressible distensible material characterized by being permeated with air,
said insulating layer overlying said first layer and being supported by said first layer,
a second layer of sheet material,
said second layer of sheet material being flexible and foldable and comprising synthetic resin,
said second layer overlying said insulating layer and being supported by said insulating layer,
said layers being in heatable relationship to said space so that heat from said air in said space passes to said first layer and thence to said insulating layer and thence to said second layer,
said structure further characterized by elastic deformability characteristics and heat transfer characteristics of said insulating layer and said second layer such that when the following snow loads are imposed on said second layer the distance from said first layer to said second layer is reduced respectively by the following percentage reductions to the following respective resulting distances expressed in percentage of the distance between said layers in the absence of any such load:



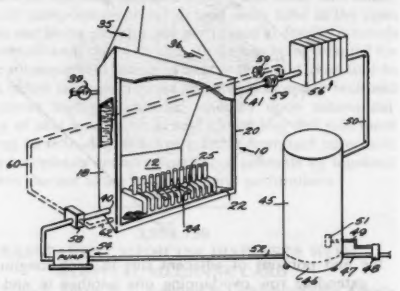
Snow load in pounds per square foot	Percentage reduction	Distance
0.5	less than 30	more than 70
20	more than 50	less than 50
30	more than 60	less than 40.

3,958,755
HYDRO-THERMO FIREPLACE AND HEATING SYSTEM THEREFOR

Clarence W. Cleer, Jr., Kane, Pa., assignor to Ridgway Steel Fabricators, Inc., Ridgway, Pa.

Filed Aug. 5, 1974, Ser. No. 495,107
Int. Cl.² F24D 3/00; F24J 3/02
U.S. Cl. 237—8 R 7 Claims

1. A heating system comprising
a. a hot water storage tank,
b. means for heating water in said water storage tank,
c. means responsive to the temperature of water within said hot water storage tank for preventing operation of said means for heating water in said hot water storage tank,
d. a fireplace jacket remote from said means for heating water in said water storage tank and comprising means for circulating water directly around an open-hearth woodburning fireplace adapted to have an open fire therein,
e. a powered pump,
f. means for transferring the heat of hot water in said storage tank and fireplace jacket to areas remote from but operatively connected to said tank and jacket, and
g. means for providing operative communication between said pump, fireplace jacket, hot water storage tank, and heat transferring means so that water heated by an open fire in said fireplace will be circulated to and from said storage tank by said pump and will be in operative communication with said heat transfer means, and so that said

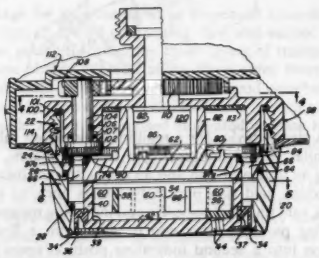


means for preventing operation of said means for heating water in said hot water storage tank responsive to the water temperature within said tank will prevent operation of said heating means when the water in said tank is heated above a predetermined temperature by an open fire in said fireplace.

3,958,756
SPRAY NOZZLES

John Trenary, Fort Collins; David Smith, Wellington; Donald W. Ruehmann, Fort Collins; Christopher W. Elkins, Fort Collins; Elmer Erwin, Fort Collins, and Roy Treadwell, Fort Collins, all of Colo., assignors to Teledyne Water Pik, Fort Collins, Colo.

Filed June 23, 1975, Ser. No. 589,433
Int. Cl.² B05B 1/08, 1/30
U.S. Cl. 239—102 21 Claims



1. In a spray nozzle that includes:
a housing having a fluid inlet and a first and a second group of fluid spray discharge outlets;
means in said housing defining a first flow path from said inlet to said first group of outlets and a second flow path from said inlet to said second group of outlets;
pulsation means in said first flow path for cyclically interrupting the flow of fluid from said inlet to said first group of outlets and cause a pulsating spray to be discharged therefrom;
said second flow path bypassing said pulsation means to cause a continuous non-pulsating spray to be discharged from said second group of outlets;
and control means for adjustably dividing flow from said inlet between said first and second flow paths;

the improvement comprising:

a spray cup assembly having a tubular main body across one end of which extends an end wall, said main body having an external diameter less than the internal diameter of the end of said housing opposite said fluid inlet so that said spray cup assembly is received within that end of said housing;

means in said end wall defining said first group of outlets;

means defining an annular groove extending around the lateral exterior of said spray cup assembly and of predetermined width in the direction axially of said spray cup assembly;

means defining a series of slots in the internal wall of said housing at said end thereof, said slots extending in said direction and being distributed around the internal circumference of said wall;

and a seal of resilient material formed into the shape of a washer having an integral cross-section in said direction composed of a pair of legs apart by a connecting web, the length of one of said legs being at least approximately the same as said predetermined width of said groove, said seal being seated between said slots and said groove with said one leg disposed in said groove and the other leg extending across the open radially inner sides of said slots so as, together with said slots, to define said second group of outlets.

3,958,757

INJECTION VALVE

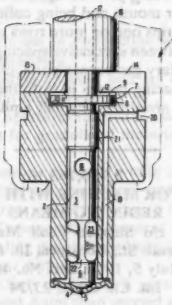
Robert Happel, Waiblingen-Bittenfeld, and Lothar Maier, Feilbach,, Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Apr. 9, 1975, Ser. No. 566,189

Claims priority, application Germany, Apr. 13, 1974, 2418227; Dec. 19, 1974, 2460111

Int. Cl.² B05B *1/32, 1/34, 9/00*

U.S. Cl. 239—125 **53 Claims**



1. An injection valve for injecting a liquid into a space subjected to pressure fluctuations during a low pressure phase, said valve comprising

a valve body;

an injection nozzle means disposed in said valve body for injecting liquid, said injection nozzle means including nozzle seat means for enclosing said valve body, at least one nozzle aperture means provided in said nozzle seat means for passing said liquid, nozzle needle means for closing said at least one nozzle aperture means, means for moving said nozzle needle means to open said nozzle aperture means, and abutment means for limiting stroke movement of said nozzle needle means in at least a direction of opening of said nozzle aperture means; and

means for enabling movement of said nozzle seat means in a direction of said stroke movement of said nozzle needle means.

3,958,758

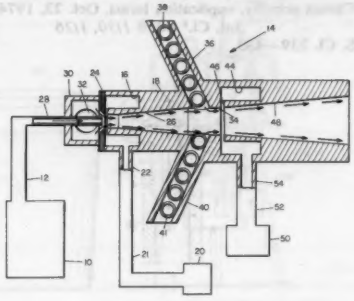
SPRAYING APPARATUS

Joseph Piorkowski, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 27, 1975, Ser. No. 580,656

Int. Cl.² B05B *7/16*

U.S. Cl. 239—133 **7 Claims**



1. An apparatus for spraying heated, powdered material onto a substrate to be coated with said powdered material which comprises, in combination:

a first fluid amplifier section;

a cool air inlet section connected to said first fluid amplifier section for furnishing an amplified flow of air;

a source of said powdered material connected to said first fluid amplifier section;

a second fluid amplifier section;

a transition section connecting said first and said second fluid amplifier sections;

at least one heated air inlet section in communication with said transition section adjacent to said second fluid amplifier section;

means, positioned in said heated air inlet section, for heating air which passes therethrough; and

a source of air under pressure connected to both said first and said second fluid amplifier sections.

3,958,759

DIRECTED ATOMIZED FUEL JET APPARATUS

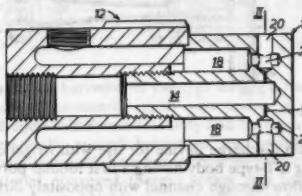
Seamus Gearoid Timoney, Dublin, Ireland

Filed Jan. 2, 1975, Ser. No. 538,170

Claims priority, application United Kingdom, Jan. 4, 1974, 47374/74

Int. Cl.² B05B *7/04*

U.S. Cl. 239—434 **16 Claims**



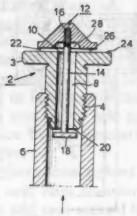
1. A liquid atomizing nozzle for an internal combustion engine comprising a first passage for a high velocity stream of air; a region designed to receive and create resonate turbulence of the air; a second passage for directing liquid into said region for atomization thereof in the turbulent air; and a third exit passage from the region for the atomized liquid, which exit passage is elongated but of restricted area so that the

atomized liquid exits as a jet capable of being directed towards an inlet of a combustion chamber.

3,958,760
SPRAY NOZZLE

Peretz Rosenberg, Moshav Beit Shearim, Israel

Filed Sept. 30, 1975, Ser. No. 618,283
Claims priority, application Israel, Oct. 23, 1974, 45916
Int. Cl.² B05B *1/30, 1/26*
U.S. Cl. 239—453 **10 Claims**

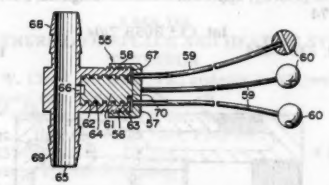


1. A spraying device comprising a nozzle formed with an outlet orifice through which the fluid issues in the form of a jet; a deflector supported close to and in alignment with the nozzle orifice so as to be impinged by the jet issuing therefrom; said deflector being floatingly mounted with respect to the nozzle so as to be movable in a lateral direction with respect to its orifice; said deflector being formed with a recess centrally of the face thereof impinged by the jet which recess is effective to automatically selfcentre the deflector with respect to the orifice upon the issuance of the jet therefrom; and limiting means limiting the floating movement of the deflector with respect to the nozzle orifice.

3,958,761
WATER DISCHARGE DEVICE FOR USE WITH IRRIGATION SYSTEMS

Sosuke Watanabe, Shimodate, Japan, assignor to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed June 7, 1973, Ser. No. 367,723
Claims priority, application Japan, June 9, 1972, 47-67368; June 9, 1972, 47-67369
Int. Cl.² B05B *1/16, 15/00*; F16L *55/00*
U.S. Cl. 239—542 **15 Claims**

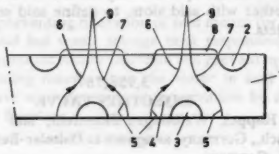


1. A fluid discharge device for use with irrigation systems comprising a T-type body having a first tubular portion which defines a flow-through channel with oppositely directed connecting end portions adapted to be inserted into cooperating end portions of respective hoses, and a second tubular portion connected substantially perpendicular to said first tubular portion and provided with a free end portion, said second tubular portion being provided with female threads on the inside surface thereof and male threads on the outside surface of said free end portion, a screw element provided with male threads on the outside surface thereof, said screw element male threads engaging said female threads of said second tubular portion and defining therebetween a continuous flow passage therethrough, an aperture disposed in said first tubular portion, said aperture providing communication between said continuous flow passage and said flow-through channel, and a locking cap element disposed on the free end portion of said second tubular element in a manner to substantially close said free end and retain said screw element against rotation and axial movement, said cap element being provided with female threads which engage the male threads on the outside of said second tubular free end portion and a plurality of openings disposed in said cap element, said openings communicating with said continuous flow passage.

3,958,762
GAS BURNER

Willem Godijn, Hilversum, Netherlands, assignor to Research Instituut Sesto B.V., Hilversum, Netherlands

Filed Oct. 15, 1974, Ser. No. 515,076
Claims priority, application Netherlands, Oct. 19, 1973, 7314389
Int. Cl.² B05B *1/14*
U.S. Cl. 239—552 **8 Claims**

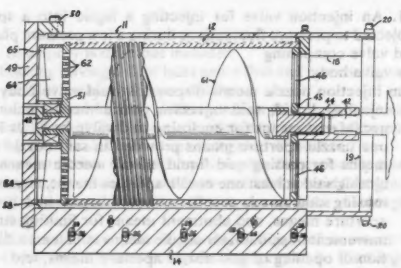


1. A gas burner comprising a mixing chamber with a burner mouth, in which a removable burner head is incorporated comprising a packet of strips, the strips of which in both longitudinal edge areas are provided with a row of spacing means, said strips being pressed against each other by wall faces of said burner mouth and being collected so as to form in said packet of strips one or more rows of slot shaped main gas burner ports between successive spacing means and one or more rows of auxiliary gas burner ports, characterized in that the rows of said spacing means in both the longitudinal edge areas of said strips are shifted by half a pitch relative to each other.

3,958,763
MEAT SEPARATOR MACHINE WITH TEMPERATURE REDUCING MEANS

Stephen A. Paoli, c/o Stephen Paoli Manufacturing Company, 2531 Eleventh St., Rockford, Ill. 61108

Filed July 5, 1974, Ser. No. 486,171
Int. Cl.² B02C *23/24*
U.S. Cl. 241—54 **9 Claims**



1. In a machine for mechanically separating comminuted edible meat from fragments of hard tissue such as bone, sinew

and cartilage, said machine having a hollow, power driven rotor with helical cutting elements and initially constricted helical passages communicating with the interior thereof, and a pressure bar extending axially of said rotor spaced from the periphery thereof, the combination comprising:

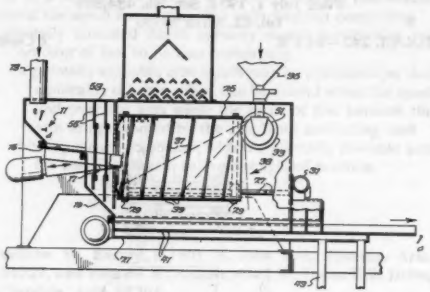
a. an end cap on said rotor having a plurality of air passages extending therethrough and communicating with the rotor interior; and

b. a plurality of air scoop elements fixed to the outer face of said end cap and adapted to sustain a flow of cooling air through said air passages and rotor as an incident to rotation of the latter.

3,958,764
GRANULATING APPARATUS

James H. Carpenter, Jr., and Bernard W. Ixer, both of Hagerstown, Md., assignors to The Carborundum Company, Niagara Falls, N.Y.

Division of Ser. No. 254,279, May 17, 1972, Pat. No. 3,848,815. This application Sept. 12, 1974, Ser. No. 505,289
Int. Cl.² B02C *17/02*
U.S. Cl. 241—74 **1 Claim**



1. Apparatus for use in connection with blast equipment, said apparatus comprising:

a. a drum including an inlet end, an outlet end, a hollow interior and an inner surface;

b. a plurality of apertures formed in said drum for providing passage ways for granulated material and blast particles therethrough;

c. spiral screw means disposed within said drum and operatively associated with said inner surfaces;

d. said spiral screw means including a first section near said inlet end and a second section near said outlet end, each section extending generally radially inwardly of said drum from said inner surface;

e. said first section extending a greater distance radially inwardly of said drum than second section, and

f. said spiral screw means having a taper from said inlet end to said outlet end of said drum, said spiral screw means being larger at said inlet end than at said outlet end.

3,958,765
SYRINGE AND NEEDLE GRINDER

James A. Musselman, 124 N. College, Salina, Kans. 67401

Filed May 12, 1975, Ser. No. 576,704
Int. Cl.² B02C *19/12*
U.S. Cl. 241—99 **8 Claims**

1. A material grinding device utilized to break up syringes, bottles and other hospital disposable items comprising:

a cylindrical housing havng a cylinder wall, planar top and bottom end plates;

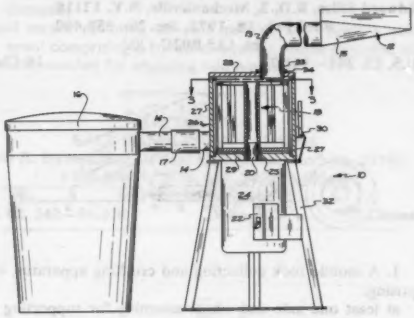
a cylindrical-shaped rotor element rotatably positioned within the housing;

power means to drive the rotor element;

a material intake pipe in the top end plate of the housing offset from the center of the housing;

a material discharge pipe in the wall of the housing;

the rotor element including a first cutting means in the form of a plurality of radial blades radiating outwardly from the axis of rotation of the rotor element in proximity with the end of the material inlet pipe whereby material entering the housing is initially cut by the first cutting means;

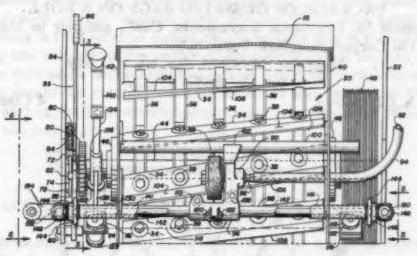


second cutting means in the rotor element in the form of a plurality of longitudinal blades positioned around the periphery thereof in parallel spaced relation to the axis of rotation of the rotor and stationary blades positioned around the inside of the wall of the cylindrical housing in parallel spaced relation with the longitudinal blades of the rotor element whereby rotation of the rotor element centrifugally discharges the ground material through the outlet pipe.

3,958,766
CUTTERHEAD ROTATING MECHANISM FOR FORAGE HARVESTER

Joe E. Shriver, East Earl, Pa., assignor to Sperry-New Holland Sperry Rand Corporation, New Holland, Pa.

Filed June 2, 1975, Ser. No. 583,067
Int. Cl.² B24B *19/00*
U.S. Cl. 241—101.2 **7 Claims**



1. In a forage harvester of the type having a frame, a shear bar mounted stationarily upon said frame, a cutter head mounted upon said frame rotatably and having a plurality of circumferentially spaced knives on the periphery thereof which coact with said shear bar in shearing relationship to cut crop material conveyed thereto within said harvester, and power means connectable to said cutter head to rotate it in shearing direction relative to said shear bar, the improvement comprising means operable manually to rotate said cutter head stepwise for inspection of the knives thereof, said means comprising in combination, a toothed ratchet wheel, means connecting said ratchet wheel to said cutter head, a handle supported at one end by said frame and the other end being engageable manually for movement thereof, and a pawl on said handle engageable with the teeth of said rachet wheel

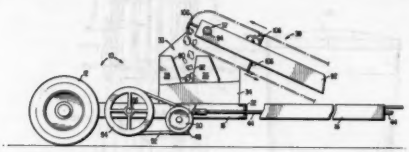
when said handle is moved in one direction, thereby to advance said cutter head and the knives thereon incrementally to permit visual inspection of said knives on said cutter head.

3,958,767

MOBILE ROCK COLLECTING AND CRUSHING

Edward Stiles, R.D. 2, Mechanicville, N.Y. 12118

Filed Feb. 18, 1975, Ser. No. 550,490
Int. Cl.² B02C 1/02
U.S. Cl. 241—101.7 10 Claims



1. A mobile rock collecting and crushing apparatus, comprising:

at least one axle and wheel assembly for supporting said apparatus in motion;

at least one support rail member attached to said axle and wheel assembly;

a pair of crusher blocks reciprocably mounted on said at least one support rail member, said crusher blocks defining a crushing volume therebetween within which said rocks are crushed;

a drive shaft rotatably mounted to said at least one support rail member adjacent said crusher blocks;

means driven by said drive shaft for reciprocating one of said crusher blocks relative to said at least one support rail member;

a rock collecting and elevating means pivotably mounted to said at least one support rail member for collecting rocks from an underlying surface and depositing them in said crushing volume; and

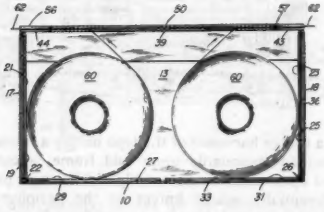
means driven by said drive shaft for operating said collecting and elevating means.

3,958,768

PACKAGE OF GUSSETED BAGS ON A ROLL

Donald M. Fairbanks, Sacramento, Calif., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 15, 1975, Ser. No. 622,549
Int. Cl.² B65D 85/671
U.S. Cl. 242—1 4 Claims



1. A package of gusseted bags on a roll adapted for protection of the bags during shipping, storage and dispensing and for convenience of dispensing which comprises:

a. a rectangular box having a bottom wall and four side walls operatively connected with each other to define a container and top closure means connecting said side walls, said box having a dispensing opening for dispensing bags adjacent the juncture of said top closure means and at least one of said side walls;

b. parallel side rail members extending along said bottom adjacent opposing side walls perpendicular to the wall adjacent said dispensing opening to terminate at edges spaced from the respective adjacent walls;

c. a roll of flattened gusseted bags supported on said side rail members and arranged in said box for dispensing bags from said roll through said dispensing opening; each of said bags having sides inwardly folded to a width less than half the flattened width of the bag, being sealed across the gussets at one end and frangibly connected at the other end to a like bag adjacent the sealed end thereof, whereby said roll has greatest diameter at the inner folds of said bags;

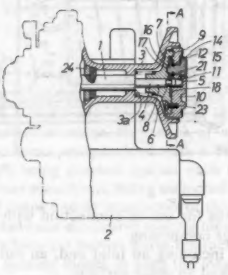
d. the said edges of said side rail members being spaced from adjacent walls by a distance less than the said width of inner folds of said bags, whereby said rolls are unsupported at said greatest diameter.

3,958,769

SPOOL MOUNTING MECHANISM IN A FISHING REEL

Toshiaki Miyamae, 2-16, 2-chome, Nishi-Iwata, Higashi-Osaka, Osaka, Japan

Filed July 1, 1974, Ser. No. 484,589
Int. Cl. A01k 89/00
U.S. Cl. 242—84.1 R 2 Claims



1. A spool mounting device for fishing reel having a rotary shaft and spool detachably mounted on said shaft, said device comprising

a. said shaft having a small diameter portion, a reduced neck portion and at the end thereof a tapered portion;

b. first means having a projection, disposed toward the said tapered end of said shaft and held rotatably thereby;

c. second means held by said first means for suitably mounting said spool on said shaft;

d. resilient means having one end engaged with said projection of said first means and the other end having a pair of legs extending substantially parallel to each other from said one end, said other end normally holding said reduced neck portion of said shaft thereby to detachably fix said first means to said second means;

e. operating lever means disposed on said second means;

f. cam means movably connected to said operating lever means and positioned between said shaft and said one end of said resilient means and held normally between said legs of said resilient means

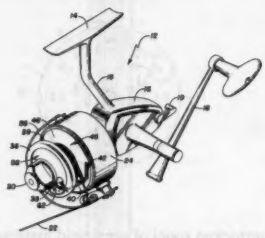
whereby movement of said operating lever means moves said cam means to outwardly extend said legs of said resilient means thereby to release the said legs from said reduced neck portion and thereby release the spool from said shaft and enable replacement thereof with another spool.

3,958,770

OPEN FACED FISHING REEL WITH DEPTH MEMORY

Joseph C. Murphy, Tulsa, Okla., assignor to St. Croix Corporation, Minneapolis, Minn.

Filed Nov. 19, 1974, Ser. No. 525,077
Int. Cl.² A01K 89/00
U.S. Cl. 242—84.1 L 13 Claims



1. In a fishing reel having a spool and fishing line wound around the spool for casting, the improvement comprising

pivotally mounted depth memory means for limiting the amount of line to be cast comprising,

a pivotally movable arm which may be positioned so that a plurality of turns of line can be wound about the spool and over the arm while the turns of line beneath the arm are prevented by the arm from unwinding; and

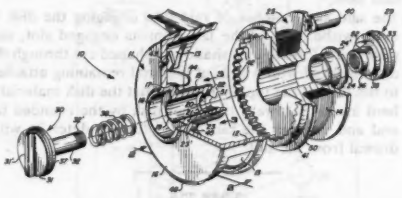
biasing means associated with the pivotally movable arm for biasing the arm to the disengaged position.

3,958,771

FISHING REEL

Woodrow W. Everett, 11801 N. 19th Ave., Phoenix, Ariz. 85029, and Edward M. Adams, 4002 W. Union Hills Drive, Glendale, Ariz. 85301

Filed Sept. 30, 1974, Ser. No. 510,292
Int. Cl.² A01K 89/02
U.S. Cl. 242—84.5 R 6 Claims



1. A fishing reel employing adjustable drag and controlled automatic release features comprising:

a hollow housing,

a spool for winding fishing line around its outer periphery rotatably mounted within said hollow of said housing,

a plurality of gear teeth fixedly mounted around said spool,

a ratchet pawl pivotally mounted on said housing for engaging said gear teeth when said spool rotates in a first direction in said housing,

means for selectively providing a drag on the rotation of said spool in said housing in a second direction,

said means comprising a bolt extending axially through said housing for threadedly engaging a member bearing against said spool for providing variable frictional producing pressure between engaging bearing surfaces of said spool and said housing,

means for releasing said drag on said spool comprising a lug mounted on said housing for engaging a protrusion on said member for rotating said member a limited distance only in said first direction thereby unthreading said member to reduce the frictional engaging pressure on said bearing surfaces of said spool and said housing, and

means mounted on said member for engaging said spool whereby said member is held from unthreading futher off said bolt when said member has unthreaded said limited distance,

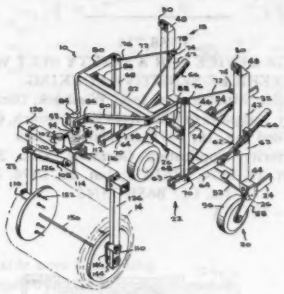
said means mounted on said member for engaging said spool comprising a frictional bearing means mounted on said member for engaging said housing.

3,958,772

BALE HANDLING APPARATUS

David R. Hynson, Rte. 1, Box 2528, Montpelier, Va. 23192

Filed July 7, 1975, Ser. No. 593,421
Int. Cl.² B65H 75/40
U.S. Cl. 242—86.5 R 17 Claims



1. A bale handling apparatus for lifting, loading, unloading, stacking and unrolling large cylindrical bales of hay, said bale handling apparatus comprising a portable support structure, a holding means for retaining the bale, an elevating means mounted on the support structure for lifting the holding means, a first rotation means on the holding means for rotating the bale about the center of the bale to unroll the hay in the bale and a second rotating means mounted on the elevating means for rotating the bale about an axis other than the center of the bale thereby producing a spiraling layer of hay as the hay in the bale is unrolled.

3,958,773

LOCK BAR ASSEMBLY FOR EMERGENCY SAFETY BELT RETRACTOR

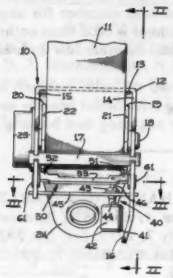
Joseph Sugar, Los Angeles, Calif., assignor to American Safety Equipment Corporation, New York, N.Y.

Filed May 20, 1974, Ser. No. 471,466
Int. Cl.² B65H 75/48
U.S. Cl. 242—107.4 R 3 Claims

1. In an emergency locking safety belt retractor mechanism for use in vehicles wherein a locking pawl is pivotally mounted between a pair of spaced retractor frame sidewalls in position to engage a ratchet wheel locking member provided on the retractor reel upon being pivoted by emergency responsive means associated with the retractor, a pair of circular bearing surfaces in said retractor frame in axially spaced relation; and a pair of circular journal members, each being of a low coefficient of friction material, mounted to said locking pawl and being journaled in said bearing surfaces, the improvement in locking pawl mounting comprising the provision of:

axial thrust plate means mounted to said journal members

and extending between the frame sidewalls and said locking pawl for preventing axial displacement of said locking



pawl relative to said frame sidewalls and for maintaining a constant spaced relation therebetween.

3,958,774

STORAGE DEVICE FOR A SAFETY BELT WITH VEHICLE-SENSITIVE LOCKING

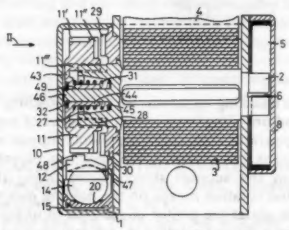
Franz Penzkofer, Munich, and Josef Wiesbock, Dachau, both of Germany, assignors to Hans Kolb KG, Munich, Germany

Filed Jan. 20, 1975, Ser. No. 542,289

Claims priority, application Germany, Oct. 29, 1974, 2451430; Oct. 29, 1974, 2451431; Jan. 21, 1974, 2402634

Int. Cl.² B65H 75/48

U.S. Cl. 242—107.4 A **8 Claims**



1. A storage device for a vehicle safety belt, said storage device comprising a housing, a coiling shaft, means mounting said coiling shaft for rotation in said housing, means for connecting a safety belt to said coiling shaft for coiling thereon, a ratchet wheel, said coiling shaft having an elongated smooth trunnion fast therewith, said ratchet wheel having a journal engaging said trunnion and mounting said ratchet wheel for rotation and axial movement relative to said coiling shaft, cooperating internal and external thread means on said ratchet wheel and said coiling shaft for effecting axial movement of said ratchet wheel in response to relative rotation between said ratchet wheel and said coiling shaft, said thread means normally interconnecting said ratchet wheel and said coiling shaft for rotation in unison, said thread means being formed separate from said trunnion and journal and arranged in spaced concentric relation relative thereto, said ratchet wheel having peripheral teeth and end teeth, a pawl for engaging said peripheral teeth for preventing rotation of said ratchet wheel with said coiling shaft, an inertia member engageable with said pawl for moving said pawl into engagement with said peripheral teeth, and fixed teeth on said housing for interlocking engagement with said end teeth after axial movement of said ratchet wheel to prevent further rotation of said coiling shaft.

3,958,775

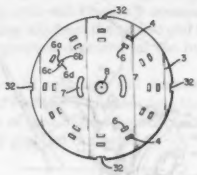
INTERLOCKING CARDBOARD SPOOL ASSEMBLY

Donald J. Liga, Youngstown, Ohio, assignor to Kessler Products Co., Inc., Youngstown, Ohio

Filed Feb. 6, 1975, Ser. No. 547,650

Int. Cl.² B65H 75/14

U.S. Cl. 242—118.8 **5 Claims**



1.

a. An interlocked spool of semi-rigid material such as cardboard for carrying flexible linear elements,

b. said spool comprising a hollow body member in the form of a right cylinder, and two disk-like side member coaxially fixed to said cylindrical body member at its ends,

c. said body member being an originally flat sheet of cardboard rolled up into a hollow cylinder, the circular edges of said cylinder having integral uniformly spaced projections extending in a generally acial direction,

d. each said projection being a tab having straight sides and a rounded end, with a side notch on each straight side just below the rounded end,

e. each said disk member having an outer concentric circle of perforations dimensioned to receive respective tabs of said cylinder so that the disks are snug against the respective ends of the cylinders with the tabs extending through said perforations,

f. each disk member having also an inner concentric circle of slots dimensioned to frictionally receive the rounded ends of said tabs with the main body of each tab bent to lie flat against its disk so that each tab extends outwardly from the cylinder through one of said first perforations and then inwardly back into the cylinder through one of said slots,

g. the said side notches of said tabs engaging the disk to deter withdrawal of the tab from its engaged slot, said slots being formed by a shallow U-shaped cut through the disk material with a strip of material remaining attached to the disk at the top of the U so that the disk material is bent inwardly toward the other disk by the rounded tab end and engages the tab end to further deter its withdrawal from the slot.

3,958,776

COP MADE OF PLASTIC MATERIAL

Ferruccio Campener Torzo, Milan, Italy, assignor to Montefibre S.p.A., Milan, Italy

Filed July 8, 1974, Ser. No. 486,618

Claims priority, application Italy, July 10, 1973, 26391/73

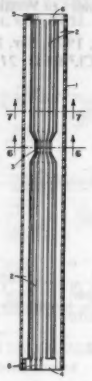
Int. Cl.² B65H 75/10, 75/12

U.S. Cl. 242—118.32 **6 Claims**

1. A light, relatively rigid, disposable cop made entirely of plastic material, and consisting essentially of a hollow cylindrical body having from 12 to 20 longitudinal reinforcing ribs disposed around the inner wall of said body, said ribs being arranged substantially radially at a substantially uniform distance from each other and being widened for a short distance in the section above their middle part for gripping the spindle on which the cop is to be mounted, said longitudinal reinforcing ribs being:

a. partially notched or cut off at the base of the cop so as to provide inside the hollow cylinder, and defining by their free ends, a region having generating lines parallel

to those of the hollow cylinder, with an axial depth of about 12 mm and a cross-section which is in the form of a substantially equilateral triangle having rounded vertices, said cross-section corresponding to that of the triang-



ular portion or shoulder of the spindle adapted to be engaged by the cop as required by ISO standards; and

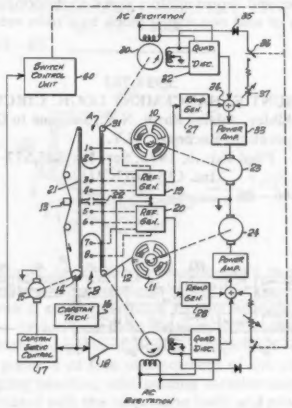
b. shorter at the top of the cop by about 6 mm with respect to the total length of the cylinder.

3,958,777

TAPE TRANSPORT REEL SERVOMECHANISM

William J. Gervais, Van Nuys, and Jerry Matula, Culver City, both of Calif., assignors to Pertec Corporation, El Segundo, Calif.

Filed Sept. 13, 1974, Ser. No. 505,861
Int. Cl.² G11B *15/58, 23/12*
U.S. Cl. 242—182 **14 Claims**



1. In a tape transport system including a capstan for moving tape past a work station from a supply to a take-up reel and wherein means are provided for forming loops between said capstan and each of said reels, a separate servo system coupled to each of said reels, each servo system comprising:

a drive motor coupled to said reel;

motor control means including a summing junction for producing a drive motor control signal;

means including a pulley engaging said tape between said loop forming means and said reel for producing a position signal proportional to the magnitude of tape movement thereat;

means for sensing when said capstan is at rest; and

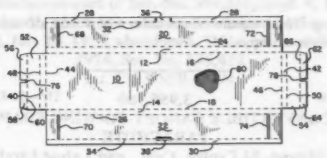
means responsive to said capstan being at rest for applying said position signal to said summing junction.

3,958,778

SELF LOCKING TEXTILE CORE

DeWayne L. Lawson, Mentor, Ky., and Raymond D. Roof, Cincinnati, Ohio, assignors to Olinkraft, Inc., West Monroe, La.

Filed May 21, 1975, Ser. No. 579,660
Int. Cl.² B65H *75/06*
U.S. Cl. 242—222 **5 Claims**



1. A textile core comprising

an elongated bottom side panel,

a pair of edge panels hinged on the opposite longitudinal side edges of the bottom side panel,

a pair of elongated top side panels each hinged at one longitudinal edge thereon to the respective pair of edge panels opposite to the bottom side panel,

a pair of rib panels hinged on the other longitudinal edges of the respective pair of elongated top side panels for being bent inward into face to face relationship,

a pair of end panels hinged on the respective end edges of the bottom side panel,

a pair of overlapping panels hinged on the respective end panels opposite the bottom side panel for overlapping respective end portions of the elongated top side panels,

each of the pair of the elongated top side panels having a pair of transverse slots formed therein and spaced from the respective ends thereof, and

two pairs of tabs, each pair of tabs hinged on a respective one of the pair of the overlapping panels for extending through respective ones of each of the pairs of slots to secure the panels in an assembled position.

3,958,779

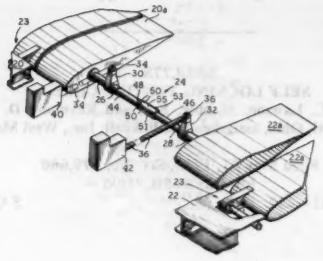
AIRCRAFT CONTROL SYSTEM WITH A JAM ISOLATING COUPLING

Richard E. Townsend, Huntington, N.Y., assignor to Fairchild Industries Inc., Germantown, Md.

Filed May 27, 1975, Ser. No. 580,896
Int. Cl.² B64C *13/42*
U.S. Cl. 244—75 R **10 Claims**

1. A control system for aircraft including aircraft structure, comprising in combination, at least two movable control members operatively connected to said aircraft structure, actuating means disposed on said aircraft and operably connected to each of said movable control members, means con-

necting said control members for permitting operation of one control member when the other is inoperable, said means



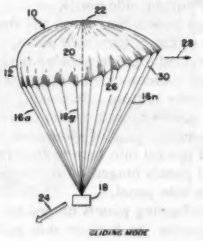
including shear means shearable when one of said control members is immovable.

3,958,780

CONVERTIBLE CANOPY-TO-WING SHAPED PARACHUTE

Jon T. Matsuo, El Centro, Calif., and Lajpat Utreja, Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 9, 1975, Ser. No. 566,459
Int. Cl.² B64D *17/34*
U.S. Cl. 244—152 **3 Claims**



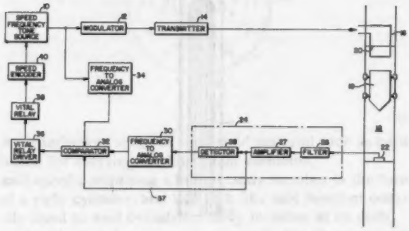
1. A convertible canopy-to-wing shaped parachute comprising:
- a normally dome-shaped canopy having a continuous and uninterrupted periphery;
- a plurality of suspension lines connected at their upper ends to spaced points around said canopy skirt and connected at their lower ends to a load;
- a fixed length pull down vent line connected at its upper end to the canopy apex and at its lower end to the load;
- a selected number of said suspension lines having a variable length beyond their normal length;
- said variable lines being graduated in length increasing in an aft direction;
- means for securing said variable length suspension lines in a fore-shortened length so that all of said suspension lines in one mode of operation are of the same length;
- a means for releasing said securing means and the variable length suspension lines whereby the canopy can be converted from a standard symmetrical dome-shaped configuration to a wing-like configuration having a high lift-to-drag ratio for a gliding mode.

3,958,781

TRAIN VEHICLE PROTECTION APPARATUS INCLUDING SIGNAL BLOCK OCCUPANCY DETERMINATION

David H. Woods, Pittsburgh, Pa., and Lawrence W. Anderson, Sao Paulo, Brazil, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 29, 1975, Ser. No. 545,231
Int. Cl.² B61L *21/06*
U.S. Cl. 246—34 R **7 Claims**



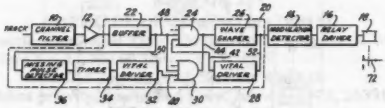
1. In control apparatus for a train vehicle operative with a track divided into a plurality of signal blocks, the combination comprising means for supplying a predetermined frequency control signal to one of said signal blocks,
- means for receiving a control signal from said one signal block,
- means for converting said supplied signal into a first representative signal,
- means for converting said received signal into a second representative signal, and
- means for comparing said first representative signal with said second representative signal to determine the occupancy of said one siignal block by a train vehicle.

3,958,782

SHUNT ENHANCEMENT LOGIC CIRCUIT

Henry C. Sibley, Adams Basin, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Feb. 6, 1975, Ser. No. 547,677
Int. Cl.² B61L *21/06*
U.S. Cl. 246—40 **9 Claims**

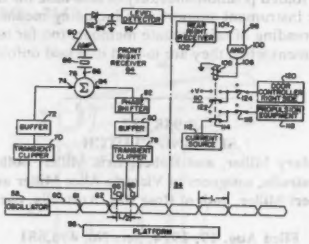


1. In a signaling system for use in connection with railroad tracks for ensuring fail-safe performance in the operation of a control device, such system including a carrier frequency receiver comprising a channel filter, a modulation detector, and a vital relay which releases only upon the occurrence of shunting of predetermined extended duration, the improvement comprising means for detecting interruption of said carrier frequency due to occurrences of comparatively short-duration shunting, and means for so extending or enhancing their time period that said occurrences of short-duration shunting ensure release of said vital relay.

3,958,783
VEHICLE ZERO SPEED DETECTION SYSTEM

Richard S. Rhoton, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 370,490, June 15, 1973, abandoned. This application Sept. 9, 1974, Ser. No. 504,406
Int. Cl.² B61L 3/00
U.S. Cl. 246—182 18 Claims



1. In a control system for a vehicle operative with a vehicle stopping area, the combination of

means operative with said vehicle stopping area for transmitting a signal having phase reversals,

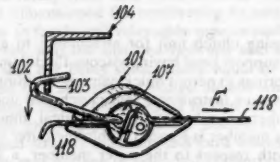
means operative with said vehicle for receiving said transmitted signal and sensing said phase reversals at a rate determined by the travel of said vehicle, and

means operative with said signal receiving means for providing a control signal when the phase reversals are sensed at a rate in accordance with a defined zero speed of said vehicle.

3,958,784
RETAINING DEVICE FOR AN ELECTRIC CABLE

Pierre Bourrieres, Cahors, France, assignor to Manufacture d'Appareillage Electrique de Cahors, Cahors, France

Filed Jan. 21, 1975, Ser. No. 543,830
Claims priority, application France, Feb. 5, 1974, 74.03791
Int. Cl.² F16L 3/00
U.S. Cl. 248—63 5 Claims



1. A retaining device for an electric cable, comprising a body which has two opposite passageways for the cable and is provided with a suspension hook for the articulated attachment of the device to a fixed support, and a cable guiding member which is capable of moving with respect to the body between a position of free displacement of the cable and a cable-clamping position, said guiding member comprising a sleeve associated with the suspension hook and provided with a passageway for the cable, said sleeve being capable of rotating about an axis located transversely with respect to the sleeve passageway and being mounted within a hollowed-out portion of the body between the two opposite passageways, said sleeve passageway being located in the line of extension of the two opposite body passageways in the position of free displacement of the cable, said sleeve passageway being angularly displaced with respect to said body passageways in the cable-clamping position, said angular displacement being such that said sleeve is partially surrounded by the winding of the cable, the hollowed-out portion of the body comprising a bore having an annular bearing portion at one end thereof, the sleeve having a cylindrical shell having one end rotatably mounted within said bearing portion, an annular flange rotatably mounted within the bore of said body on the other end of said cylindrical shell, means for maintaining said sleeve axially within the hollowed-out portion of said body, said means comprising a radial lug integral with the cylindrical shell of the sleeve and applied against a lateral face of the bearing portion of the bore in the service position of the device, said face having a recess through which the lug passes, said lug coinciding with said recess in a position of introduction of the sleeve within the body, the last-named position being spaced from the position of free displacement of the cable and from the position of clamping of the cable.

3,958,785
MULTI-LEGGED TRASH BAG HOOP

Fred George Aboud, 3812 Taylorsville Rd., Louisville, Ky. 40220

Continuation-in-part of Ser. No. 394,351, Sept. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 271,634, July 13, 1972, abandoned. This application Dec. 26, 1974, Ser. No. 536,412
Int. Cl.² B65B 67/04
U.S. Cl. 248—97 8 Claims

1. A multi-legged trash bag hoop comprising:

A. an endless circular hoop through which the upper mouth end portion of a trash bag may be extended upwardly and then inverted annularly outward and downward over the hoop.

1. said hoop having alternate positions including a substantially horizontal position for vertical-loading purposes and an inclined position for horizontal-loading purposes;

B. at least three curved legs for supporting the hoop; and

C. means for securing said curved legs to the hoop to extend downwardly and curve inwardly from their securements to support the hoop in said horizontal position for vertical loading purposes, the lower ends of said inwardly-curving legs being spaced a substantial distance inward from the intersection of the horizontal plane of the bottom of said legs with a downward geometric projection of the hoop, said securing means being operative

1. to secure said curved legs pivotally for movement to a storage position wherein they lie adjacent the hoop and conform to the curvature of its periphery, and

2. to secure at least two legs detachably so that they may be detached, reversed and resecured to extend downwardly and curve outwardly in position to cooperate with an intermediate portion of the hoop to hold the hoop in said inclined position.

3,958,786

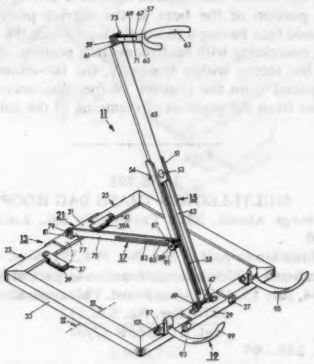
STAND FOR MUSICAL INSTRUMENTS

Gary A. Mann, 3212 James St., Fort Worth, Tex. 76110

Filed Nov. 27, 1974, Ser. No. 527,660

Int. Cl.² F16M 11/00

U.S. Cl. 248—176 **8 Claims**



1. A portable stand for being emplaced on a floor and supporting musical instruments and the like comprising:

a. a base that includes a substantially planar top for being emplaced closely adjacent said floor so as to avoid entangling cords of musical instruments; said base including:

i. a plurality of pieces that are pivotally connected together; that, in an unfolded position, define peripheral support for said substantially planar top; and that are pivotally movable into a folded position of dimension less than said peripheral support in at least one direction; the peripherally outermost pieces being foldable into a substantially vertical plane; and

ii. locking means for locking said pieces into said unfolded position;

b. an extensible main support member that includes:

i. a plurality of at least first and second lineal members; said first lineal member being pivotally carried by said base and movable into an upright position for supporting said instrument and into a folded position substantially parallel with said top; said at least second lineal member being slidably movable longitudinally of said first lineal member for extension of the uppermost lineal member to a predetermined height in a supporting position;

ii. an instrument engaging member for supporting said instrument; said instrument engaging member being pivotally carried by said uppermost lineal member of said main support member adjacent the upper end thereof in said supporting position and foldable into said folded position for transport; and

iii. retainer means for retaining said lineal members extended in said supporting position; said retainer means being manually operable into and out of retaining engagement with said lineal members;

c. bracing and latching means for latching said main support member into a predetermined supporting position; said bracing and latching means including a plurality of predetermined latching locations for a plurality of said supporting positions at respective different angles relative to said base for supporting different said instruments; said bracing and latching means being pivotally mounted on said base and pivotally connected with said main support member; said bracing and latching means having means for clamping said base and said main support member into said set supporting position that will not collapse even if dragged across said floor by cords and the like; and

d. lower instrument support carried by said base for supporting said instrument

said lower instrument support including a plurality of arcuate members, one each being pivotally mounted respectively on one each of two sections of said base; said arcuate members being pivotally movable into an unfolded position extending laterally exteriorly of said base for supporting said instrument and into a folded position interiorly of said base for transport; said lower instrument support also including means for preventing spreading of said arcuate members too far to support said instrument when they are moved into said unfolded position.

3,958,787

SLIPPING CLUTCH

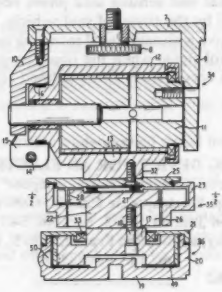
Jeanette Mary Miller, and Robert Eric Miller, both of Rose Bay, Australia, assignors to Victoria Alice Miller and Timothy Robert Miller, both of Rose Bay, Australia, part interest to each

Filed Aug. 19, 1974, Ser. No. 498,681

Claims priority, application Australia, Aug. 24, 1973, 4613/73

Int. Cl.² F16M 11/12

U.S. Cl. 248—183 **18 Claims**



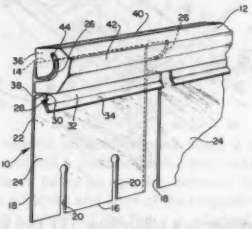
1. A slipping clutch unit for attachment to a camera or instrument support head having viscous-fluid-damped tilt and panning bearings to permit quick panning or tilting movement of the camera or instrument, said clutch unit comprising an outer member, a substantially cylindrical inner member, which inner member is located within the outer member and rotatable with respect to the outer member, a substantially annular brake band which is positioned within and between the outer member and the inner member and engageable with the inner member, the band being radially split to provide at least two free ends, which are spaced apart from each other, adjustment means permitting the spacing between the free ends of the band to be varied and thereby causing the brake band to engage with the inner member, means restraining relative rotational movement of the band with respect to the outer member, and means restraining axial movement of the inner and outer members with respect to each other, the members being rotatable with respect to each other in a substantially friction-free manner when the brake band is fully released, whereby the clutch unit, upon engagement of the band with the inner member at a selected brake pressure, allows transmission of an applied torque between the members and, on said applied torque exceeding a given torque which is dependent upon the selected brake pressure, allows slipping disengagement of the members with respect to each other, whereupon said slipping disengagement is maintainable at an applied torque which is less than the given torque and

thereby permitting a sudden and quick relative movement of the inner and outer members.

3,958,788
DISPLAY CARD HOLDER ASSEMBLY

Hans J. Feibelman, Cranston, R.I., assignor to A. & H. Mfg. Co., Providence, R.I.

Filed Sept. 23, 1974, Ser. No. 508,269
Int. Cl.² A47H *1/00, 1/14*
U.S. Cl. 248—214 **2 Claims**



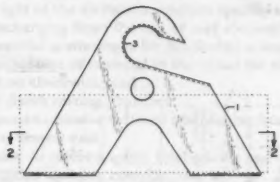
1. A display card holder assembly comprising in combination a display card constructed of a flexible plastic material, said card having a flat front surface adapted to receive thereon an article to be displayed, first flange means extending rearwardly from said card having substantially smooth and uninterrupted opposed surfaces, said first flange means being located adjacent to but spaced from the top edge of said card and extending transversely of the card, said first flange means including a first portion that is joined to said card in substantially perpendicular relation and a second portion that is joined to said first portion and that extends upwardly and rearwardly in a generally curvilinear manner, second flange means extending rearwardly of said card in generally perpendicular relation thereto for at least a portion thereof and spaced below said first flange means, the combination further comprising an elongated horizontal bar that releasably and slidably receives said card for display thereon, said bar having a substantially flat front surface, a longitudinal slot in said bar extending inwardly from said front surface, said slot being shaped and dimensioned for conforming to said first flange means so as to freely and releasably receive said first flange means therein, and the distance between said slot and the bottom of said bar being substantially equal to the spacing between said first and second flange means, whereby when said first flange means is positioned in said slot, said second flange means grippingly engages the bottom of said bar to releasably and slidably maintain said card assembled to said bar, with the rear surface of said card in abutting relation to the front surface of said bar, and with the portion of said card located below said second flange means depending below said bar.

3,958,789
BRICK HANGER

Leo A. McKenzie, 3540 Ridgeway Drive, Bethel Park, Pa. 15102

Filed Jan. 9, 1975, Ser. No. 539,629
Int. Cl.² E06B *3/64;* **E04B** *5/52*
U.S. Cl. 248—340 **1 Claim**

1. A hanger for detachably supporting rows of bricks while making overhead spans and arches, comprising a unitary sheet metal piece having at the top, a cut-out portion in the form of a partial circle adjoining a lateral slot extending downwardly and outwardly to form a hook shaped top portion surrounded along its inner periphery and that of said slot with a flanged portion of said sheet metal piece, and a pair of downwardly and outwardly extending leg portions terminating, at their bottom ends only, in toothed ledge portions extending outwardly from both sides of the hanger at right angles thereto, and a central circular hole located below and immediately adjacent said lateral slot and above the level of the supported bricks and of sufficiently large diameter so as to receive a

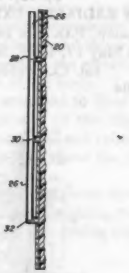


supporting rod for the bricks after they are hung in place whereby selective numbers of bricks may be hooked onto a lifting rod extending through said cut-out portion when lifted into place, followed by insertion of a permanent support rod through said central circular hole.

3,958,790
CONCRETE WALL FORMING PANEL WITH INFLATABLE LINER MEANS

Samuel C. Scott, 2519 Walnut St., Denver, Colo. 80205

Filed May 6, 1974, Ser. No. 466,986
Int. Cl.² E04G *9/05*
U.S. Cl. 249—65 **9 Claims**



1. Apparatus for stripping large panel forms from set concrete wall-like structures comprising:

a large, rectangular, generally planar surfaced, substantially rigid concrete form panel member, said member being arranged for upright positioning so as to abut other panel members to provide a form structure spaced from similar panel members with a space for a concrete wall therebetween;

a soft, resilient, flexible form liner having a rear, planar surface mounted on and said rear surface being face to face and coextensive with the planar surfaced panel member;

sealing means securing said liner to said panel member at least along peripheral areas providing at least one unsealed portion generally center-wise of said panel member arranged as an inflatable pocket and said liner being in face engagement with said panel member when not inflated; and

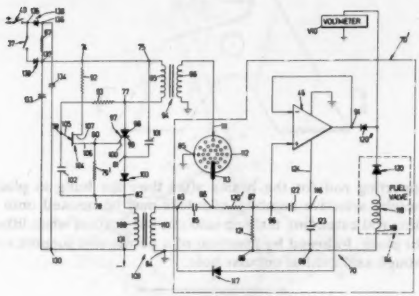
means through said panel for introducing low pressure fluid into said pocket for expanding the same and breaking the combined panel and liner from contained concrete.

3,958,791

IGNITION SYSTEM AND COMPONENTS THEREOF

Elmer A. Carlson, Agoura, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 447,889, March 4, 1974, Pat. No. 3,870,929. This application Nov. 25, 1974, Ser. No. 526,585
Int. Cl.² F16K 31/02
U.S. Cl. 251—129 2 Claims



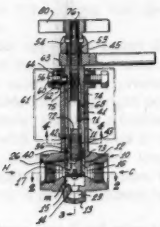
1. Fuel burning apparatus comprising: an amplifier having an output to supply current thereat; and an electrically operable valve connected to said amplifier output, said amplifier having short circuit protection, whereby said valve may be short circuited for test purposes.

3,958,792

VALVE WITH RADIALLY EXPANSIVE VALVE PLUG

Richard C. Barkelew, P.O. Box 1415, Carmel, Calif. 93921

Filed May 17, 1974, Ser. No. 470,911
Int. Cl.² F16K 11/02
U.S. Cl. 251—304 14 Claims



1. A cylindrical valve plug for use in the ported bore of a valve, comprising:

a cylindrical valve core, and an elastic non-metallic sleeve non-rotatably compressed thereon, said sleeve and core being confined under radial elastic compression in said valve bore, and having a range of radial elastic deformation in response to variations in external compressive pressure,

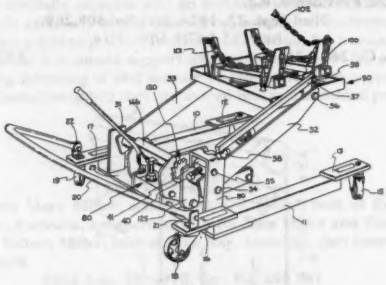
the inner surface of said elastic sleeve and the exterior surface of said core having interlocking formations affording a multiplicity of pockets therebetween into which portions of the elastic sleeve are partially elastically displaced by elastic compression of the sleeve about the core, said pockets affording added space for additional displacement of sleeve material into said space through a fluctuating range of increasing temperatures, and also affording accommodation for a range of bore diameter variances from said predetermined diameter.

3,958,793

TRANSMISSION JACK

Julian Garate, 855 Marietta Way, Sparks, Nev. 89431

Filed Feb. 19, 1975, Ser. No. 550,990
Int. Cl.² B66F 5/04
U.S. Cl. 254—10 B 1 Claim



1. A transmission jack comprising: (1) Two elongated side frame elements at a spaced distance from one another; (2) Four wheels, one attached adjacent each end of each of said elongated frame members; (3) A third frame member attached to one end of each of said elongated frame members forming, with said elongated frame members an essentially "u" shaped frame; (4) Handle means pivotally attached to said elongated frame members adjacent the end thereof to which the third frame member is attached; (5) A pair of upright brackets attached to said third frame member, one of each being adjacent each of said elongated side frame members; (6) A rotatably mounted shaft extending between said two upright members; (7) A pair of arms mounted upon said rotatably mounted shaft extending therefrom in a parallel relationship to said side frame members and away from the said third frame member; (8) Hydraulic pump means attached to said third frame member; (9) Means attached to said rotatably mounted shaft activated by a hydraulic cylinder, said means being suitable to rotate said shaft; (10) Means connecting said hydraulic pump and said hydraulic cylinder; (11) Ratchet means attached to said rotatably mounted shaft in such manner as to prevent counter rotation thereof; (12) Rectangular platform means attached to the ends of said arms depending from said rotatable shaft at the ends opposite said rotatable shaft; (13) A pair of chain holding bracket means mounted upon said platform; (14) A chain adjustably mounted between each pair of said chain holding bracket-means; (15) A bracket means; adjustably mounted between diagonally opposed ends of said two chain holding bracket means; (16) An adjustment arm located in parallel relationship with one of said arms extending from said shaft, said adjustment arm being attached to one of said upstanding brackets attached to said third frame member, the other end being attached to a bracket fastened to said platform; and means attached to said parallel arm for adjusting the distance therefrom from said bracket attached to said third frame member.

3,958,794

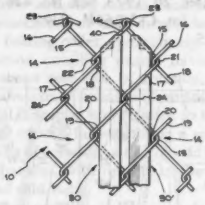
SLAT FOR CHAIN LINK FENCE

Peter Suprunuk, and Alex Keseloff, both of 1424 S. Gerhart Ave., Commerce, Calif. 90022

Filed Jan. 14, 1975, Ser. No. 540,828
Int. Cl.² B21F 27/00
U.S. Cl. 256—34 10 Claims

1. A slat for insertion in vertical orientation in a chain link fence wherein strands make a diamond pattern mesh with vertical axes passing corner to corner, each said slot comprising a single piece of sheet metal of uniform thickness and having a longitudinally extending side portion at each side

edge, said slat having a breadth less than half the greatest transverse width of the diamond pattern, means forming a notch in each side portion spaced from the nearest end a distance less than the breadth of the slat for engagement



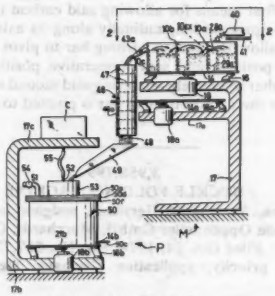
beneath the nearest adjacent strand when a corresponding corner of the slat has a position folded over said nearest adjacent strand, there being an opening between the folded over corner and an adjacent end edge of the respective side portion through which a strand of the fence is adapted to pass.

3,958,795

APPARATUS FOR MIXING MATERIALS

Dietmar Boenisch, 45, Morillenhang, Aachen, Germany

Division of Ser. No. 274,762, July 24, 1972, Pat. No. 3,871,623. This application Mar. 11, 1975, Ser. No. 557,347
Claims priority, application Germany, July 26, 1971, 2137277
Int. Cl.[2] B22C 5/02, 5/12; B01F 15/02, 5/26
U.S. Cl. 259—2 16 Claims



1. A mixing apparatus for mixing fluent materials, particularly foundry molding materials, comprising:
- a horizontal base and a plurality of at least two mix vessels secured on the base;
- each mix vessel having a vertical circumferentially enclosing side wall and containing respective mixing means;
- said base being resiliently mounted by means permitting orbital oscillation to the base, and therewith to each vessel oscillation about a respective vertical axis located within the confines of the vessel;
- driving means imparting to said base and thereby to each said vessel said orbital oscillation in a horizontal direction thereby imparting a principally horizontally circular main flow to material contained in the vessel;
- each said mixing means comprising at least one vertical tube-like element
  - rigidly connected to and extending longitudinally within said vessel in a vertical direction away from the vessel bottom, and
  - having in its bottom end region an inlet aperture opening to its interior tubular space above the vessel bottom and
  - facing toward the direction from which said main flow approaches,
  - whereby said element intercepts through said aperture a portion of the main flow to develop at least over the height of the element a separate spirally ascending flow discharging from the top of said element with circumferential scattering to be distributed at least in part over the surface of material in the vessel for mixing recirculation therewith; and
- a rapid finish mixing chamber
  - disposed to receive material discharging from each of said two vessels and
  - agitated to effect a quick final mixing and discharge of a finished molding composition.

7. In combination with a mixing apparatus as described in claim 1,
- an injection apparatus for injecting molding material into foundry mold flasks or core boxes comprising:
- an injection cylinder vessel
  - resiliently mounted with its axis vertical and driven by means imparting to the cylinder an orbital motion of translation with its axis describing a closed path on an intersecting horizontal plane, thereby to develop an agitated flow of material in the vessel,
- said injection vessel having
  - a hollow cylindrical body closed at top and bottom ends,
  - a charging opening in its upper end through which molding materials are charged into the vessel, and
  - an inlet for air under pressure in its upper part;
- an injection tube arranged in an upright position and extending within the vessel body from near the lower end thereof outwardly through the upper end thereof;
- a flexible elastic diaphragm below the air inlet and the charging opening, extending completely across the interior of the injector vessel body and below the lower end of the injection tube, providing the effective material-containing interior surface of the body;
  - said diaphragm being arranged to have sealing engagement with the lower end of the injection tube and spacing from the bottom end and cylindrical interior of the body when the region above the diaphragm is unpressurized;
- an air outlet from the body space below the diaphragm; and
- means for directing finished molding composition, discharging from the rapid finish mixing chamber, into said charging opening.

3,958,796

QUENCH-HARDENING OF PIPES

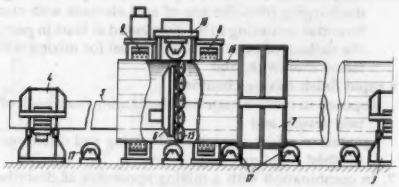
Helmut Weidner, Dortmund-Korne, and Helmut Landgraf, Rumeln-Kaldenhausen, both of Germany, assignors to Mannesmannrohren-Werke AG, Dusseldorf, Germany

Filed Sept. 26, 1974, Ser. No. 509,569
Claims priority, application Germany, Oct. 2, 1973, 2349913
Int. Cl.[2] C21D 1/62
U.S. Cl. 266—123 7 Claims

1. In a station for quench-hardening of pipes of large diameter and having an induction heater, quenching means acting on the pipe from the outside and a quenching head acting on the pipe from the inside, the improvement comprising:
- roller means for engaging and bearing against the pipe on the inside thereby positioning the quenching head centrally in the pipe right in a zone of quenching of the pipe from the inside;
- thrust mount means for supporting the quenching head outside from the pipe but for central positioning therein;
- a sizing roller stand with calibrating/sizing rolls engaging the pipe over almost its entire periphery adjacent the inside

quenching head and particularly adjacent to said roller means;

a plurality of nozzles included in said outside quenching means and disposed right at but ahead of the stand, for prequenching the pipe from the outside and immediately ahead of the sizing in the stand; and



an additional plurality of nozzles also included in said outside quenching means and disposed behind said stand for continuing quenching the pipe from the outside as it leaves the stand.

3,958,797

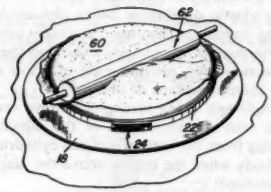
PIE BOARD

George F. Brow, 70 Sierra Way, West Yarmouth, Mass. 02783

Filed Dec. 26, 1974, Ser. No. 536,444

Int. Cl.² A47J *43/00*

U.S. Cl. 269—302.1 3 Claims



1. A pie board comprising, in combination, a circular board having a substantially planar upper surface bounded by and extending fully between a continuous cylindrical outer peripheral edge, said board including a lower surface substantially paralleling said upper surface, a plurality of anti-slip depending support members support from said lower surface in widely horizontally spaced relation for supporting said board in spaced relation above a work surface upon which said support members rest, a flexible sheet overlying said upper surface and of a plan area, sufficiently greater than the plan area of said board and partially dependent on the effective heighth of said depending support members and the thickness of said board, to enable the marginal portions of said sheet all to extend downwardly over and below said peripheral edge and the lower surface of said board to a level appreciably below the lower extremities of said support members for defining a peripheral apron about said board over said work surface when said support members are supported therefrom, a resilient split cylindrical clamp band having adjacent opposite ends and snugly positionable about said board over the portion of said sheet extending downwardly over said peripheral edge and with the upper edge of said band substantially flush with the upper surface of the portion of said sheet disposed over said planar upper surface, and latch means operably connecting said opposite ends of said band for clamping said band over the portions of said sheet disposed over the peripheral edge of said board.

3,958,798

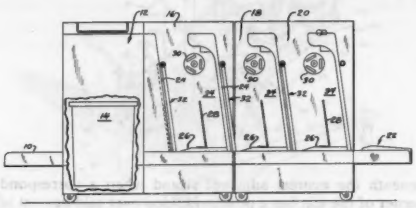
DELEAVER FOR CONTINUOUS BUSINESS FORMS ASSEMBLY

Kenneth W. Bower, Des Plaines, and Burl R. Jones, Sr., Arlington Heights, both of Ill., assignors to Uarco Incorporated, Barrington, Ill.

Filed Dec. 20, 1973, Ser. No. 426,454

Int. Cl.² B65H *41/00*

U.S. Cl. 270—52.5 4 Claims



1. A deleaver for separating superimposed plies of stationery and interleaved carbon plies of a continuous business forms assembly including at least one upwardly open chute for receiving at least one stationery ply of the continuous business forms assembly, a powered carbon take-up reel associated with the chute for removing a carbon ply adjacent said one stationery ply from said one stationery ply, a carbon turning bar in said chute about which said carbon ply may be trained and directed to said carbon take-up reel, and means substantially permanently affixing one end of said carbon turning bar to said deleaver so as to prevent removal of said carbon turning bar from said deleaver except for servicing or the like, including means mounting said one end for selective movement of said carbon turning bar on said deleaver between operative and inoperative positions, said mounting means including first means for allowing said carbon turning bar to slidably reciprocate longitudinally along its axis, and second means to allow the carbon turning bar to pivot between said operative position and said inoperative position, said first means further selectively rendering said second means inoperative when the carbon turning bar is pivoted to the operative position.

3,958,799

BUCKLE FOLDING MACHINE

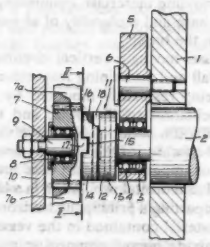
Emil Klenk, Murrhardt, Germany, assignor to Firma Maschinenbau Oppenweiler GmbH, Murrhardt, Germany

Filed Oct. 24, 1974, Ser. No. 517,773

Claims priority, application Germany, Oct. 27, 1973, 2353961

Int. Cl.² B65H *45/14*

U.S. Cl. 270—68 A 11 Claims



1. A buckle folding machine comprising

a plurality of adjustably mounted folding roller pairs adjustable with respect to their spacing relative to each other,

said plurality of folding roller pairs comprising a plurality of adjustable folding rollers,

a common drive means operatively coupled to said folding rollers for synchronous drive thereof comprising a stationarily mounted drive wheel for each adjustable folding roller,

one equalization coupling means each for operatively coupling an associated of said drive wheel with said each adjustable folding roller, respectively,

said equalization coupling means having two hubs each rotatable about one axis of rotation, respectively, and relative to the axis of rotation of one of said hubs defining a first radial direction and relative to the axis of rotation of the other of said hubs defining a second radial direction, said axis of rotation of one of said hubs being aligned or spaced parallel, with respect to the axis of rotation of the other of said hubs,

said equalization coupling means including an intermediate member means and driving surface means for operatively connecting said two hubs positively for rotation with each other and for operatively moving said intermediate member means in said first radial direction relative to one of said hubs and in said second radial direction relative to the other of said hubs, aid first and second radial directions being perpendicular to each other, for transferring required turning moment from the associated drive wheel to said each adjustable folding roller.

3,958,800

INCLINED PAPER FEED

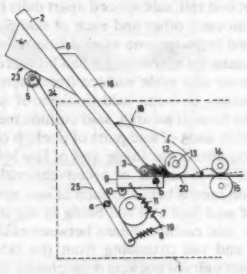
Albert George Ronald Gates, London, England, assignor to Gestetner Limited, London, England

Filed Jan. 23, 1975, Ser. No. 543,310

Claims priority, application United Kingdom, Jan. 24, 1974, 3277/74

Int. Cl.² B65H *1/10*

U.S. Cl. 271—126 **9 Claims**



1. A feed mechanism for feeding individual sheets from a stack, the mechanism comprising: frame means; a first surface carried by said frame means for supporting an edge of a stack of sheets; a rotatable sheet feed roller adjacent to said first surface to define a nip therewith through which sheets may be fed, the axis of the sheet feed roller being parallel to said first surface; a plate member above the first support surface; a second support surface on said plate member for supporting a face of the stack of sheets; the second support surface extending at an obtuse angle to the first support surface with the said sheet feed roller included within said obtuse angle, means urging the lowermost part of the second surface towards the nip between the sheet feed roller and the first support surface; and means for supporting the plate member for rotation about an axis parallel to said first surface during advance of the plate member towards the sheet feed roller, whereby said obtuse angle increases as the spacing between the lowermost part of the second surface and the said nip decreases.

3,958,801

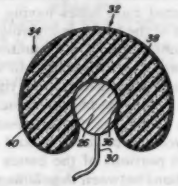
PROTECTIVE CUSHION FOR GYMNASTIC EQUIPMENT

Ronald J. Correa, 97 Ocean Grove Ave., Swansea, Mass. 02777

Filed Apr. 2, 1975, Ser. No. 564,324

Int. Cl.² A63B *3/00*

U.S. Cl. 272—63 **7 Claims**



1. In combination with gymnastic equipment known as uneven parallel bars includng a framework having a base portion, an upper bar mounted on the framework, and lower bar of substantially ovate shape in cross-section mounted on the framework and arranged substantially parallel to the upper bar, the lower bar disposed closer to the base portion than is disposed the upper bar; a resilient pad mounted on the lower bar and arranged for protecting vulnerable parts of a female gymnast's body from injury during extensive contact with the lower bar, the pad including a cylindrically shaped tube having a predetermined length, constructed from a resilient material, and provided with a slot extending along the entire length of the tube, the slot shaped and dimensioned for snap-action mating with the ovate-shaped lower bar and permitting the pad to be frictionally retained on the lower bar.

3,958,802

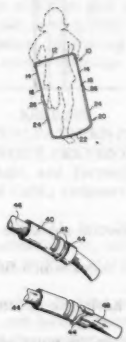
JUMPING HOOP

Ernest R. Thornton, Rte. 2, Box 228-C, Point Pleasant, W. Va. 25550

Continuation of Ser. No. 262,936, June 15, 1972, abandoned. This application June 14, 1974, Ser. No. 479,406

Int. Cl.² A63B *5/22*

U.S. Cl. 272—74 **5 Claims**



1. An adjustable jumping hoop apparatus comprising a first elongated member bent in a U-shape having a cross portion and two leg portions, the leg portions terminating in a first pair of spaced elongated distal sections, a second elongated uniform tubular member bent in a complementary U-shape having a cross portion and two leg portions which terminate outwardly in a second pair of spaced elongated distal sections,

the first pair of distal sections having relatively rigid joint means for connection to the second pair of distal sections, and the second pair of distal sections having flexible resilient joint means for telescopically joining the relatively rigid joint means of the first pair of distal sections, thereby holding the first and second elongated U-shaped members together in a jumping hoop of a selected size, wherein the rigid joint means comprises elongated elements and wherein the flexible joint means comprises elongated rigid tubes having segmental openings spaced from ends of the tubes and having flexible round resilient bands circumferentially surrounding the tubes at the segmental openings and extending into the segmental openings, the elongated elements of the first rigid joint means being positioned in the tubes, the bands extending through the segmental openings to engage the elements, whereby relative longitudinal movement of the first and second joint means frictionally draws portions of the bands from the segmental openings to positions between the elements and inner walls of the tubes, tightly wedging the elements in the tubes, against further relative axial movement in the same direction.

3,958,803

GYMNASTIC PUSH-PULL EXERCISE APPLIANCE

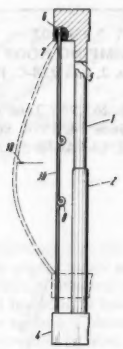
Werner Geisselbrecht, 3001, Meitze, Germany

Filed Mar. 17, 1975, Ser. No. 559,199

Claims priority, application Germany, July 3, 1974, 2431882

Int. Cl.² A63B *21/00*

U.S. Cl. 272—135 **6 Claims**



1. A gymnastic exercise appliance for pull and press exercises comprising:

two empty hollow tubes which fit telescopically into one another;

said hollow tubes having no structure positioned internally of the tubes;

a handle mounted on the outer end of each of said tubes; and

a plurality of elastic spring gripping means for directly and uninterruptingly connecting one handle with the other handle to resist any inward collapsing or telescoping action of the tubes; said means includes elongated elements positioned substantially parallel to the common central longitudinal axis of the tubes and lying outside the tubes, said spring elements constituting linear elastic springs along their entire lengths.

3,958,804

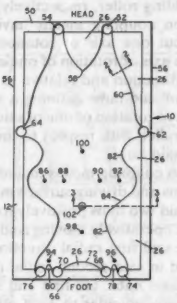
BILLIARD GAME TABLE

Eric G. Godfrey, 830 NW. 174 St., Miami, Fla. 33169

Filed Nov. 16, 1973, Ser. No. 416,691

Int. Cl.² A63D *15/00, 15/20*

U.S. Cl. 273—6 **4 Claims**



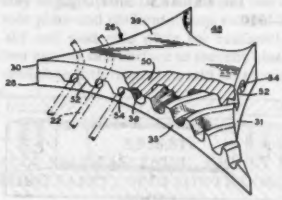
1. A substantially rectangular billiard game table having a playing surface including a plurality of interconnected playing areas thereon, said playing surface being encompassed by a head end rail, a foot end rail, and two side rails, said side rails each being substantially longer than either of said head end rail or said foot end rail, said head end rail having only one pair of spaced ball pockets located therein, said head end rail pockets being spaced about equidistantly from said side rails and from each other, each of said side rails having only one ball pocket located therein, each said one ball pocket being located somewhat nearer said head end rail than said foot end rail, two spaced apart pairs of closely adjacent pockets located in said foot end rail, said spaced apart pairs being substantially spaced from each other and each of said pairs being substantially spaced from the one of said side rails adjacent thereto, cushion means for cushioning a ball hit thereagainst extending inwardly over said table surface from each of said rails, said cushion means between said pockets of said head end rail being in the form of an arch, said cushion means between each pocket within each of said pairs of pockets of said foot end rail being frusto-conical in shape and of less length, from base to apex, than the diameter of a conventional size billiard ball, said cushion means between each of said spaced apart pairs of pockets of said foot end rail being in the shape of a segment of a circle, said cushion means between said head end rail and said foot end rail extending from the side of each of said spaced apart pairs of pockets most closely adjacent one of said side rails to said side pocket in said one of said side rails and from there to said pocket in said head end rail most closely adjacent said one side rail, said cushion means between said head end rail pocket and said side rail pocket being in the form of reverse curves, said cushion means between said each of said spaced apart foot end rail pockets and said side rail pocket also being in the form of reverse curves but including one straight line portion, a plurality of initial ball locator spots permanently imprinted on said table surface, one of said spots being a cue ball locator spot located on the longitudinal center line of said table surface, another one of said spots being a center ball locator spot located on the center of said table surface, the other of said locator spots each having a corresponding one of the ball pockets in one of the side or end rails serving as a target pocket therefor, all the other of said other of said locator spots being so located that a straight path centered thereon of a width equal to the diameter of a conventional billiard ball from said other of said other of said locator spots to said target pockets intersects one of said cushion means.

3,958,805

RACKET YOKE

Adrianus A. G. Cooper, Alliance, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed July 22, 1975, Ser. No. 598,081
Int. Cl.[2] A63B 49/00
U.S. Cl. 273—73 G 5 Claims



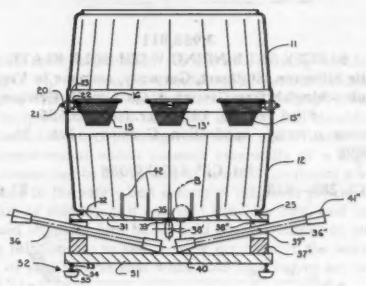
1. A throat for a racket, which comprises two sections each having its inner surface formed with a plurality of crooked grooves to provide a plurality of crooked ribs intermediate the grooves, the ribs of each throat section being constructed and arranged to interlock with and contact the ribs and part of the transverse extent of the grooves of the other throat section and cooperate with the remaining part of the grooves to form stringholes through the throat.

3,958,806

BARREL BALL GAME

Asa Elliott Brown, 7 Mt. View St., Hamburg, N.J. 07419

Filed Aug. 11, 1970, Ser. No. 62,841
Int. Cl.[2] A63B 63/06; A63F 7/06, 7/14
U.S. Cl. 273—85 C 5 Claims



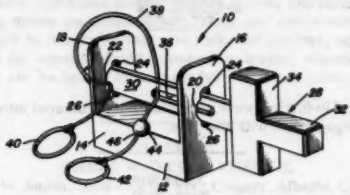
1. An amusement ball game comprising: means defining a transparent housing having an arcuate interior portion and a tapered floor portion inclined downwardly from the periphery of said arcuate interior portion to a common central portion; a plurality of ball-receiving means disposed in circumferentially spaced-apart relationship within an upper portion of said housing for receiving therethrough a game ball; means mounting each of said ball-receiving means for rotational movement around the inner periphery of said arcuate interior portion of said housing; means for effecting rotational movement of said plurality of ball-receiving means; a game ball disposed within said housing; means defining a plurality of apertures in said tapered floor portion each dimensioned to receive therethrough a portion only of said game ball to thereby releasably hold same in position to be shot towards said ball-receiving means; and a plurality of manually-actuated paddle assemblies each positioned adjacent one of said apertures and cooperative therewith when said game ball is disposed therein to shoot said game ball towards one of said ball-receiving means, each said paddle assembly comprising an elongated rod having a ball-striking end and a hand-striking end, and mounting means mounting said elongated rod for manual pivotal movement in response to manual depression of said hand-striking end from a first position wherein said ball-striking end is spaced-apart from its associated aperture to a second position wherein said ball-striking end partially extends through its associated aperture.

3,958,807

SLOTTED-INSERT EXTRACTION PUZZLE

James F. Hand, 328 N. 6th, Douglas, Wyo. 82633

Continuation-in-part of Ser. No. 517,594, Nov. 21, 1974, abandoned. This application July 11, 1975, Ser. No. 595,122
Int. Cl.[2] A63F 9/08
U.S. Cl. 273—159 11 Claims



11. A puzzle including first and second abutments having first and second openings formed therethrough, an elongated piece having one end portion thereof removably projectable through said openings and including a third opening formed therein through which the portions of said abutments having said first and second openings formed therein are removably receivable, an elongated flexible member having a pair of first and second enlargements anchored to its opposite end portions, said enlargements each being of a size and shape to prevent their passage through said first and second openings and to allow its passage through said third opening, said flexible member passing through one of said first and second openings with said pair of enlargements disposed on opposite sides of said one opening, a third enlargement mounted on said flexible member between said first and second enlargements, said third enlargement being of a size and shape preventing its passage through said third opening, but allowing it to be received through said first and second openings, the other end portion of said second piece including abutment means of a size and shape preventing its passage through either of said first and second openings.

3,958,808

CONTROLLED CLOSING PATTERN PACKING UNIT FOR BLOWOUT PREVENTER

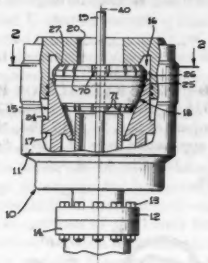
George E. Lewis, Arcadia, and Fernando Murman, Rancho Palos Verdes, both of Calif., assignors to Hydril Company, Los Angeles, Calif.

Division of Ser. No. 483,311, June 26, 1974, Pat. No. 3,917,293. This application Feb. 25, 1975, Ser. No. 552,859
Int. Cl.[2] F16J 15/12
U.S. Cl. 277—1 6 Claims

1. In the method of sealing off about well pipe, and employing an annular packer unit having metallic inserts generally circularly spaced about the packer axis and an annulus of elastomeric material embedding webs formed by the inserts, the pipe located to project axially through the packer unit, the pipe outer dimension being such that the pipe is engagable by the elastomeric material upon constriction of the packer, the steps that include

a. constricting the packer to effect radially inward displacement of the inserts thereby causing interengagement of certain inserts and flow of the material between the inserts and in folds toward the pipe, and

b. continuing the packing constriction to urge other inserts inwardly and relatively toward said interengaged inserts,



and to further pressurize said folds of material into sealing engagement with the pipe.

3,958,809

TURNING

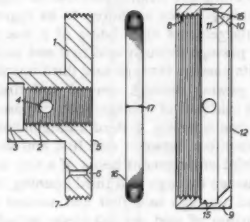
Roy Edward Child, The Old Hyde, Little Yeldham, Essex, England

Filed Dec. 10, 1973, Ser. No. 423,256

Claims priority, application United Kingdom, Dec. 13, 1973, 57403/72; Jan. 25, 1973, 3754/73

Int. Cl.² B23B *5/08*

U.S. Cl. 279—1 L **14 Claims**



1. A lathe chuck arrangement comprising a main body having an axis of rotation, mounting means on said main body for mounting said main body for rotation by a lathe driving member, said main body having an end surface for opposing an end of a workpiece to be turned, a clamping member, cooperating means on said main body and said clamping member for axially positioning said clamping member relative to said main body, said clamping member having therein a workpiece receiving aperture disposed concentric to said axis of rotation and axially spaced from said surface, and a resilient member disposed entirely within said clamping member, said aperture being at least in part defined by a seating surface for said resilient member, said seating surface facing generally radially inwardly towards said main body for applying a combined radial and axial force on a workpiece portion passed through said aperture in response to axial movement of said clamping member towards said main body, said clamping member having a storage area formed therein for said resilient member for storing said resilient member during engagement of a workpiece with said chuck, said storage area extending radially outwardly beyond said seating surface to an extent for allowing said resilient member to outwardly expand therein sufficiently for a workpiece to freely pass through said resilient member.

3,958,810

SKI WITH TOP EDGE PORTIONS OF PLASTIC MATERIAL AND DEVICE FOR SECURING THE EDGE PORTIONS DURING MANUFACTURE

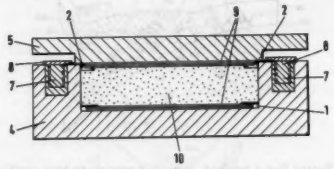
Walter Böhm, Ort 143, A-6322 Kirchbichl, Tirol, Austria

Filed Jan. 13, 1975, Ser. No. 540,694

Claims priority, application Austria, Jan. 21, 1974, 481/74

Int. Cl.² A63C *5/04, 5/12*

U.S. Cl. 280—610 **7 Claims**



1. A ski comprising:
a bottom surface sheet;
bottom edge portions;
a top surface sheet;
top edge portions; and
a core formed of expanded plastic foam material for bonding together said bottom surface sheet, said bottom edge portions, said top surface sheet, and said top edge portions;
said top edge portions having auxiliary strips aligned with the surface of said top edge portions located at the surface of the ski and extending outwardly from the side of the top edge portions, said top edge portions additionally having means for supporting said top surface sheet prior to the formation of said core.

3,958,811

SAFETY SKI BINDING WITH SOLE PLATE

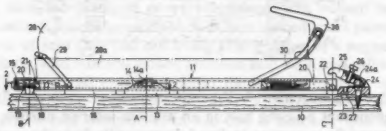
Brigitte Sittmann, Stuttgart, Germany, assignor to Vereinigte Baubeschlagfabriken Gretsch & Co. GmbH, Germany

Filed Feb. 25, 1974, Ser. No. 445,656

Claims priority, application Germany, Feb. 23, 1973, 2308898

Int. Cl.² A63C *9/086*

U.S. Cl. 280—618 **81 Claims**



1. A safety ski binding comprising:
a sole plate,
boot attaching means for attaching a ski boot to said sole plate,
lateral detent means including inter-engageable lateral detent members carried by a ski and said sole plate for detachably fastening said sole plate to said ski, said lateral detent members being disposed at respective lateral sides of said sole plate in a first cross plane of said sole plate,
latching means for maintaining said lateral detent members in engagement with one another to releasably latch said sole plate to said ski in such a manner that the lateral detent members are releasable from one another with a consequent release of said sole plate from said ski in response to forces acting on said sole plate corresponding to at least one of a twisting and forward fall of a skier using said ski boot,

and sole plate supporting means disposed in a second cross plane of said sole plate and including means separate from said latching means and lateral detent members for supporting said sole plate in vertical position at said second cross plane while permitting lateral deflection of said sole plate in said second cross plane,

wherein said supporting means includes a member laterally movably engageable with a surface of one of said ski and said sole plate and resilient means carried by the other of said ski and said sole plate for resiliently forcing said member against said surface to thereby elastically support said sole plate with respect to said ski at said second cross plane.

3,958,812

PARTIALLY SELF-FASTENING, HIGHLY EFFECTIVE THREE-POINT SAFETY BELT FOR THE OCCUPANTS OF VEHICLES

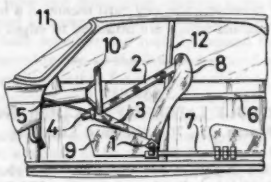
Roland Satzinger, Hammelburger Strasse 21 a, D-8731 Euerdorf, Germany

Filed Feb. 10, 1975, Ser. No. 548,853

Claims priority, application Germany, Feb. 18, 1974, 2407757

Int. Cl.² B60R *21/02*

U.S. Cl. 280—746 **14 Claims**



1. In a safety belt system for use in a moving vehicle comprising a lap belt and a shoulder belt interconnected and provided with at least one lock half which lock half is engaged by a reciprocating lock half, said lap belt and shoulder belt disposed to overlie a passenger seated on a seat in said vehicle, the improvement which consists essentially of a tensioned strap connected to the vehicle at one end proximate a vehicle door and to the safety belt system at the other proximate the junction of said lap belt and said shoulder belt, said lap belt and said shoulder belt being held by said tensioned strap in facing relationship to said vehicle door above the horizontal plane of said vehicle seat when said lock halves are not engaged.

3,958,813

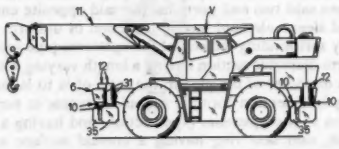
POSITIVE SAFETY LOCKING SYSTEM FOR POWERED OUTRIGGER BEAMS

Steve J. Carey, Cedar Rapids, Iowa, assignor to Harnischfeger Corporation, Milwaukee, Wis.

Filed Mar. 17, 1975, Ser. No. 558,926

Int. Cl.² B60S *9/00;* **B66C** *23/80*

U.S. Cl. 280—755 **10 Claims**



1. Hydraulically extensible outrigger beam apparatus for a wheel supported vehicle having a frame, said apparatus comprising a pair of extensible stabilizer outrigger beams for spanning laterally underneath the frame in criss-cross fashion, each beam having a pivotal connection at one end to one side of the frame, said beams extending laterally beyond the other side of said frame from which they are pivotally connected, a motor for controllably pivoting each of said beams about its pivotal connection to the frame whereby the vertical position of the beam with respect to the frame is readily adjusted, and a vertically positioned interlocking ratchet means operatively connected between said frame and each beam for locking each beam in a fixed position about its pivotal connection to prevent said beam from upward pivotal movement, said ratchet means including a vertically extending rachet rack having a free lower end, said lower end slidably abutting against its respective said beam, said interlocking ratchet means also including a vertically disposed rack guide rigidly secured to said frame and for slidably guiding said rack, cooperating means mounted on said frame and cooperating with said rack to releasably lock said rack, and remotely operated means for operating said cooperating means, whereby said beams are locked in their extended vehicle stabilizing position.

3,958,814

THREE WHEELED VEHICLE

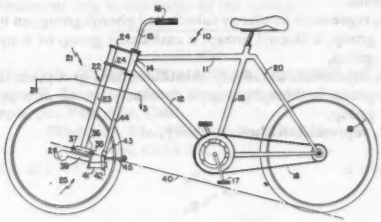
David W. Smith, 3808 - 7A St. SW., Calgary, Alberta, Canada

Filed Dec. 18, 1974, Ser. No. 533,986

Claims priority, application Canada, Sept. 13, 1974, 209172

Int. Cl.² B62K *5/08*

U.S. Cl. 280—269 **29 Claims**



1. In a wheeled vehicle which includes a main frame, a single rear wheel in said frame, a seat for the rider and a means of propulsion, a head tube on the front end of said frame and a steering means including a central shaft bearingly mounted in said tube by said central shaft; the improvement which comprises in combination head tube extension means secured to said head tube and extending downwardly therefrom, a transversely situated front wheel structure, a front wheel at each end of said front wheel structure, means bearingly mounting said wheels one to each end of said structure, bearing means mounting the lower end of said head tube extension means to said front wheel structure, said bearing means lying substantially parallel to the longitudinal axis of said vehicle whereby said main frame may lean with reference to said front wheel structure, and means operatively connecting said steering means to said front wheels whereby turning of said steering means initiates simultaneous turning of both of said front wheels, such that leaning movement and turning movement are independent of each other, said means operatively connecting said steering means to said front wheels including means extending from the lower end of said central shaft of said steering means, a steering guide bearing secured to said front wheel structure substantially intermediate the ends thereof, said means extending from the lower end of said central shaft being journalled for rotation within said steering guide bearing, steering arm means secured to said last mentioned means and extending therefrom, and linkage pivotally connected by one end thereof to said steering arm means and

being operatively connected by the other ends thereof to said wheels.

3,958,815
PRESSURE-SENSITIVE RECORDING MATERIALS

Albert Lucien Poot, Kontich; Raymond Gerard Lemahieu, Mortsel; Wilhelmus Janssens, Aarschot, and Antoine August de Jaeger, Wilrijk, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

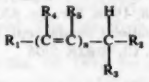
Filed Dec. 27, 1973, Ser. No. 428,687

Claims priority, application United Kingdom, Dec. 28, 1972, 59843/72; Apr. 11, 1973, 17403/73

Int. Cl.² B41M *5/10, 5/14, 5/22*

U.S. Cl. 282—27.5 **19 Claims**

1. A pressure-recording process in which a methine dye is produced by bringing image-wise into reactive contact with the aid of pressure an acid compound having a pKa of about 2–5 with a dye precursor compound corresponding to the following general formula and capable of reacting with said acid compound to form a methine dye:



wherein:

R_1 represents an alkoxy substituted phenyl group, an indolyl group, a thienyl group, a carbazolyl group or a pyrrolyl group,

R_2 represents an alkoxy substituted aryl group, an indolyl group, a thienyl group, a carbazolyl group or a pyrrolyl group,

R_3 represents hydroxyl, alkoxy, or

wherein each of R_8 and R_9 (same or different) represents hydrogen or an alkyl group or R_8 and R_9 together represent the necessary atoms to close a N-morpholinyl nucleus or N-piperidyl nucleus,

each of R_4 and R_5 represents hydrogen, or R_4 represents phenyl and R_5 hydrogen, and

n is 0 or 1.

3,958,816
NOTATION RELATED BOOK MARKERS

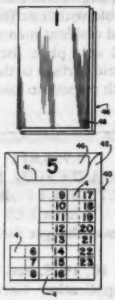
Robert H. Remmey, III, 7752 Fay Ave., La Jolla, Calif. 92037

Filed Mar. 21, 1975, Ser. No. 560,322

Int. Cl.² B42F *21/00*

U.S. Cl. 283—38 **10 Claims**

1. A book notation system apparatus comprising a plurality of page markers having identification marks for identifying individual markers, the markers having adhesive attaching means for attaching the markers to pages of a book, separate key card means for receiving information related to individual markers, the key card means having a front face and a rear face and release coating marker-holding means on the front face of the key card means, for holding the markers by the adhesive attaching means, the key card means having identification means related to the marker identification marks and having areas for writing notations along the identification means, and the key card means having mounting means on the



rear face for mounting the key card means in a book remote from marker means which are attached to edges of pages.

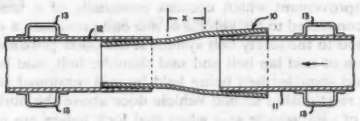
3,958,817
DOUBLE TAPERED PIPE COUPLING

Richard O. Marsh, Jr., 701 Standard Life Bldg., Pittsburgh, Pa. 15222

Continuation-in-part of Ser. No. 438,635, Feb. 1, 1974, abandoned, which is a division of Ser. No. 270,715, July 11, 1972, abandoned. This application Jan. 24, 1975, Ser. No. 543,968

Int. Cl.² F16L *17/02*

U.S. Cl. 285—16 **5 Claims**



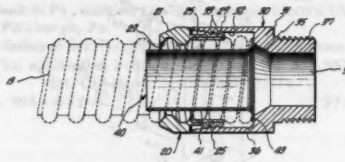
1. A pipe coupling of the threadless sleeve type for connecting two juxtaposed metallic dredge pipe sections, said coupling comprising a sleeve element of metal one end portion of which is tapered so as to fit telescopically within the downstream pipe section to provide metal-to-metal contact therewith, said taper being in the range of about 3½° to 5°, said sleeve element having its opposite end portion formed to telescopically surround the upstream pipe section and having a relatively short section of varying diameter intervening between said two end portions, the said opposite end portion of said sleeve element having a section of uniform diameter closely surrounding the end of the upstream pipe section, said uniform diameter section having a length varying with respect to the diameter of the pipe in the ratio of ⅛ to ¼, and terminating in a section forming a conical recess in surrounding relation to the upstream pipe section, and having a seal ring therein, said seal ring having a conical surface and being shiftable axially from a non-sealing position into a wedged position between the conical surface of said recess and the external surface of the upstream pipe section to provide a seal.

3,958,818

FITTING ASSEMBLY FOR FLEXIBLE TUBING

Richard Lewis Mason, Hoffman Estates, Ill., assignor to Litton Industrial Products, Inc., Beverly Hills, Calif.

Continuation of Ser. No. 284,213, Aug. 28, 1972, abandoned. This application Oct. 21, 1974, Ser. No. 517,580
Int. Cl.[2] F16L *15/00*
U.S. Cl. 285—92 5 Claims



1. A fitting assembly for connection to the end of a flexible tubing formed by coils of spirally wound resilient thread, said assembly comprising:

a first coupling part having a threaded bore for threadedly engaging the coils of the flexible tubing with a portion of the coils at the end of the tube having been passed through the first coupling part;

a second coupling part having means for engaging the end of the tube and detachably interengaging the first coupling part to compress the portion of the coils at the end of the tube together and radially expand the tube in the compressed region as the first and second coupling parts are brought together for engagement; and

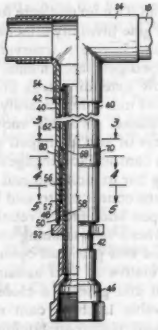
a third coupling part disposed intermediate the first and second coupling parts and attached to the first coupling part, said third coupling part having an interior surface portion adapted to be spaced from peripheral surface regions of the tube before compression of the coils and frictionally engageable with said surface regions after compression when the first and second coupling parts are interengaged, thereby tightly retaining the fitting assembly onto the tube with the compression of the coils further preventing the coils from threadedly passing back through the threaded bore of said first coupling part.

3,958,819

ADJUSTABLE DROP OR RISER NIPPLE

William C. Tifft, 53 Swan Ave., Seymour, Conn. 06483

Filed Mar. 21, 1975, Ser. No. 560,751
Int. Cl.[2] A62C *37/08*; F16L *15/02*
U.S. Cl. 285—302 1 Claim



1. A low cost adjustable drop or riser nipple construction for fire-extinguisher sprinkler systems, comprising in combination:

a. a pair of relatively axially movable inner and outer telescoping pipes, said pipes being constituted of pieces of thin-walled tubing capable of being bulged radially outward, with the inner piece being receivable in the smallest internal diameter of the outer piece,

b. said outer pipe being constituted of ductile metal and having a through bore, and being adapted at one end for attachment to a fire-extinguisher sprinkler system to receive extinguishing fluid therefrom,

c. said outer pipe having a portion of larger internal diameter than the remainder of the pipe,

d. internal screw threads at the other end of said outer pipe,

e. a nut surrounding the inner pipe and having external screw threads engaged with said internal screw threads,

f. said nut having a bushing portion on which said external threads are disposed, located between said pipes and adapted to be longitudinally shifted as the nut is screwed into said internal screw threads,

g. a yieldable sealing ring disposed between said pipes and engagable with said bushing portion so as to be subjected to axial force therefrom, and

h. an abutment ring constituted of ductile metal, disposed between said pipes and rigidly and immovably secured in the larger internal diameter portion of the outer pipe,

i. said abutment ring being engaged with the sealing ring and constituting a backing for the latter whereby force applied by the bushing portion of the nut causes the sealing ring to press and seal against the pipes,

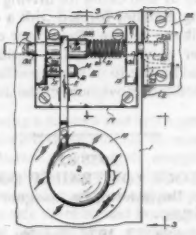
j. said abutment ring being permanently mechanically tightly fitted into the outer pipe against axial dislodgement, said outer pipe and ring being outwardly bulged by flowing of the metals thereof so as to hold captive the abutment ring in the bulge of the tubing.

3,958,820

DOOR LOCK WITH AUTOMATIC UNLOCKING MEANS

Lawrence R. Teeple, Portland, Oreg., assignor to Lawrence R. Teeple, Jr., Palo Alto, Calif.

Filed Nov. 25, 1974, Ser. No. 526,859
Int. Cl.[2] E05C *15/02*
U.S. Cl. 292—92 9 Claims



6. A locking mechanism for use on panic doors and the like permitting automatic unlocking of the door by a person's hand during gripping of a door mounted doorknob, said lock mechanism comprising,

a base,

a bolt slidably carried by said base and axially extendable beyond a door edge into locked engagement with a door frame, and

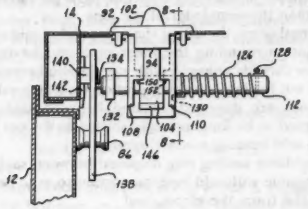
means operable to automatically retract said bolt for door unlocking during gripping of the doorknob, said automatic means including bolt release means having a hand actuated contact member radially spaced outwardly from the doorknob, means extending intermediate said contact member and said bolt, and operable upon the bolt to release same in response to displacement of the contact member by the hand during normal gripping of the doorknob.

3,958,821

DOOR OPERATING ASSEMBLY FOR MERCHANDISING MACHINE OR THE LIKE

Frank T. Scalera, Maplewood, N.J., assignor to Rowe International Inc., Whippany, N.J.

Filed Feb. 25, 1974, Ser. No. 445,824
Int. Cl.[2] E05C *19/10*
U.S. Cl. 292—97 **3 Claims**



1. An operating assembly for a merchandising machine cabinet door including in combination, a merchandising machine cabinet having an open front, a door adapted to close said front, a hinge mounting said door along a vertical edge thereof on said cabinet for swinging movement between an open position permitting access to the interior of said cabinet through said front and a closed position over said front, a strike mounted on said cabinet, a latching member, means mounting said latching member on said door for movement around a first generally horizontal axis between a first position in engagement with said strike and a second position out of engagement with said strike, an operating handle, means comprising a shaft mounting said operating handle on said door for movement around a second generally horizontal axis between a home position and a fully open position, said second axis being spaced from said first axis, and means responsive to movement of said handle from said fully open position to said home position for moving said latching member from its second position to its first position, said latching member moving means comprising a crank carried by said shaft and a crank pin carried by said crank for driving said latching member, said latching member formed with a cam surface which engages said strike to exert a lifting force on said door as said latching member moves to its first position in response to movement of said handle to its home position to overcome sag in the door to facilitate movement of the door to a fully closed position.

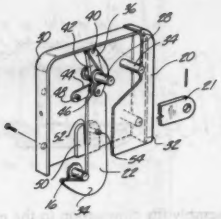
3,958,822

LOCK FOR TRAILER DOOR

John A. Germer, Doylestown, Pa., assignor to The Budd Company, Troy, Mich.

Filed Aug. 23, 1974, Ser. No. 499,963
Int. Cl.[2] E05C *5/00*
U.S. Cl. 292—113 **1 Claim**

1. An assembly for latching a movable door to a keeper element secured to a sill comprising a housing secured to said door, a main shaft rotatably mounted to said housing about a center pivot, an elongated latch having two ends with a curved portion on one end movable to engage said keeper element during a locking operation and to be disengaged and away from said keeper element durin an unlocking operation, a plate guide secured to said housing having an elongated slot, a pivot pin secured intermediate the ends of said latch and disposed to ride in said slot to control the path of movement of said latch during locking and unlocking operations, a lever fixed to said main shaft, a pair of links of fixed lengths connecting the other end of said latch to said lever, a swingable link pivotally mounted between the other end of said latch and said housing, the movement of said lever from an unlocked to a locked positon causing said latch to move about an arcuate path until said curved portion is positioned below said keeper, means for directing continued movement of said latch vertically upwardly until said curved portion of said latch engages and partially surrounds said keeper, the direction of said continued movement of said latch being in the same plane as said center pivot, with a still further movement of said lever



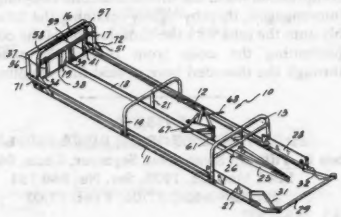
after engagement to a stop by said lever with said keeper toggling said pair of links past the center position of said center pivot whereby said assembly is maintained in a locked position, an angle hasp for limiting the movement of said lever during a locking operation, and said angle hasp and said lever including aligned openings to receive a padlock.

3,958,823

AUTOMATIC GATE FOR A BALE ACCUMULATOR

Gary L. Erlenbusch, and Richard H. Mott, both of Sioux Falls, S. Dak., assignors to Du-Al Manufacturing Company, Sioux Falls, S. Dak.

Filed July 5, 1974, Ser. No. 485,903
Int. Cl.[2] A05C *3/16, 19/10*
U.S. Cl. 292—226 **1 Claim**



1. An improved latch for an end gate for a bale accumulator comprising, an end gate pivotally attached at its upper end to said accumulator and having a transverse locking bar at its lower end, a U-shaped gate latch means having a cross member and downwardly extending legs pivotally connected to said accumulator and movable upwardly to unlatch said gate, a pair of spring biased pivotable movable latching cams mounted on said legs of said U-shaped gate latch means and each formed with a cam surface engageable with the opposite ends of said locking bar to lock said end gate to said accumulator, a release means connected to said U-shaped gate means to pivot said U-shaped latch means relative to said accumulator to a position where said latching cams are clear of said locking bar and said end gate can open said U-shaped latch means moveable relative to said accumulator to a position where it locks said end gate in a closed position with said spring biased movable latching cam means engaging said locking bar, and said U-shaped latching means capable of passing by said locking bar of said end gate to the locked position because said spring biased movable latching cams are pivoted upwardly by said locking bar when the ends of said locking bar engage their cam surfaces such that only said

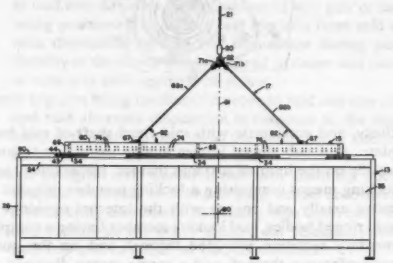
latching cams move to lock said end gate, and stops formed on said pivoted latching cams engageable with said U-shaped gate latch means to limit their movement in one direction.

3,958,824

LIFTING FRAME AND METHODS OF LIFTING PREFABRICATED BUILDING MODULES

Roy E. Crews, Allison Park, and Eugene D. Legg, West Newton, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 399,599, Sept. 21, 1973, abandoned.
This application Feb. 20, 1975, Ser. No. 551,562
Int. Cl.² B66C *1/10*; E04G *21/14*
U.S. Cl. 294—67 DA **37 Claims**



1. A detachable and adjustable lifting frame for lifting without longitudinal tilting an elongated building module having a frame which includes first and second elongated frame members, such lifting frame being adapted for use with a lifting harness comprising a plurality of flexible connectors having their upper ends connected at a single point of suspension, comprising,

first and second elongated beams, each of said elongated beams being adapted to be fastened to the upper portion of one of opposed sides of the building module,

first means for rigidly fastening said first and second elongated beams to the respective first and second frame members at spaced intervals along their lengths,

first and second cross-brace beams, each of said cross-brace beams being adapted to be diposed transversely of said first and second elongated beams,

second means connected to said first and second cross-brace beams for attaching the lower ends of the connectors of the lifting harness to said first and second cross-brace beams, and

third means for releasably fastening said first and second cross-brace beams to said first and second elongated beams to form a rigid frame, said first and second cross-brace beams being positioned to cause the point of suspension to align longitudinally with the center of gravity of the building module.

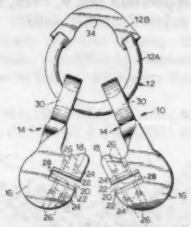
3,958,825

BEAM CLAMP

Irving Diamond, 161 Wilder St., Hillside, N.J. 07205

Filed Feb. 18, 1975, Ser. No. 550,734
Int. Cl.² B66C *1/64*
U.S. Cl. 294—78 R **6 Claims**

1. A beam clamp comprising a ring and a pair of arms, said ring consisting entirely of a plate portion and a rod portion, said rod portion having a substantially uniform circular cross-section from end to end and said plate portion having a rectangular cross section, corresponding ends of said portions being welded together to form the ring, each arm having an opening therethrough receiving the rod portion of said ring and having



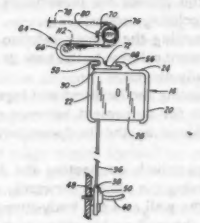
a slot containing spaced jaws adapted to engage the flange of a beam.

3,958,826

WINDSHIELD FOR GOLF CARTS

Frank E. Upton, Wichita, Kans., assignor to Federated Merchandisers, Inc., Wichita, Kans.

Filed May 13, 1974, Ser. No. 469,428
Int. Cl.² B62J *17/00*
U.S. Cl. 296—78 R **6 Claims**



1. In a vehicle having a driver's seat and a generally horizontal roof member forward of and above the normal head position of the driver thereof, a windshield comprising:

a. a housing substantially the width of the driver's seat, said housing defines an elongated cavity having an elongated opening on one side thereof, said housing having a slotted portion therein, said housing extending approximately from one side of said driver's seat to the other;

b. a pair of brackets, said brackets each having a first portion slidably engaged in the slotted portion of said housing and a second portion extending from the first portion and connected to said horizontal roof member, the first portion of said brackets has a fastener member rigidly securing said brackets to said housing, the second portion of said brackets has a cross sectionally semi-annular outer end portion;

c. a roller mounted in said housing;

d. an extendable and retractable flexible transparent sheet of material, almost as wide as said housing is long, rollably mounted on said roller; and

e. attachment means on an outer edge portion of said sheet constructed and adapted to removably secure same when extended to a member on said vehicle in the lower portion thereof and forward of said driver's seat, thereby providing a windshield for said vehicle.

3,958,827

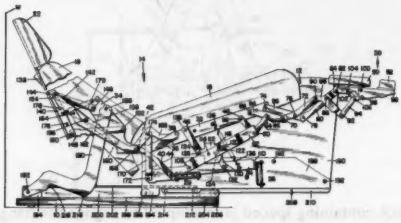
RECLINING CHAIR

Frank M. Re, Holyoke, Mass., assignor to Dual Manufacturing and Engineering Incorporated, Holyoke, Mass.

Continuation-in-part of Ser. No. 307,176, Nov. 16, 1972, abandoned. This application Jan. 9, 1975, Ser. No. 539,696

Int. Cl.² A47C 1/03

U.S. Cl. 297—61 5 Claims



1. A reclining chair characterized by being positionable in close adjacency to and free of attachment to a room wall or article of furniture when disposed in upright sitting mode and to be shiftable into any reclining mode free of any physical contact with that room wall or article of furniture the reclining chair kinematically constituting a single mechanism consisting of:

a base, a chassis supported relative to the base,

a body-support including a seat and a back separable from the seat,

a headrest, a legrest, means for mounting the body-support relative to the chassis for movements between upright sitting and reclining modes,

means for mounting the chassis relative to the base in a linear movement relative to the base as the body-support is concurrently moved,

means for mounting the headrest and legrest relative to the body-support for movement between retracted and extended positions as the body-support is concurrently moved,

and means operatively-connecting the body-support and base for moving the chassis forwardly and progressively away from the wall and the body-support relative to the chassis and the wall as transition is made from upright sitting position toward a reclining position and for moving the chassis rearwardly and progressively toward the wall and the body-support relative to the chassis and the wall as transition is made from a reclining position toward upright sitting position.

3,958,828

RECLINING SEAT DEVICE FOR MOTOR CAR

Hideo Ishida, and Chusaku Yamanashi, both of Kosai, Japan, assignors to Fuji Kiko Kabushiki Kaisha, Tokyo and Ikeda Bussan Kabushiki Kaisha, both of, Japan

Filed Nov. 29, 1973, Ser. No. 420,164

Claims priority, application Japan, Feb. 14, 1973, 48-19954; Mar. 28, 1973, 48-37650; June 12, 1973, 48-66530

Int. Cl.² A47C 3/00

U.S. Cl. 297—355 21 Claims

1. Device for setting a seat back at a desired angular position relative to a seat cushion to which said seat back is pivotably connected, said seat back and said seat cushion forming a seat, comprising:

a. a base plate secured to a side surface of said seat cushion, said base plate having a fixed shaft,

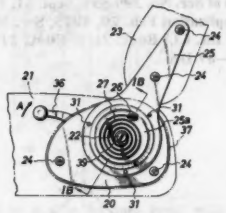
b. an arm member including a base portion pivotably mounted on said shaft, and an arm portion integral with said base portion and fixed to the side surface of said seat back,

c. a spring means for biasing said arm member forwardly about said shaft,

d. means for normally locking said arm member to said base plate, and

e. means for unlocking said arm member from said base plate, said unlocking means including a forward release lever pivotably supported by said shaft at the base portion of said forward lever,

said locking means including two substantially ringed bodies secured to said arm member and said base plate, respectively, and concentric with said fixed shaft of said base plate, said two ringed bodies having serrations tapered axially on the internal surfaces thereof, respectively, said locking means comprising a locking member adapted to move axially and engage with the internal openings of said ringed bodies, said locking member having a complementary serration provided through and on the outer circumference thereof, and a spring means disposed on the side of the greater diameter end surface of said locking member for pushing said locking member axially to engage with said two ringed bodies respectively.



3,958,829

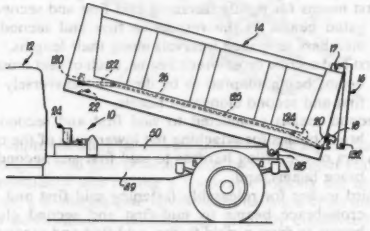
SAFETY ASSEMBLY FOR DUMP BEDS

Coy B. Brown, 2810 Holiday Drive, Arlington, Tex. 76010

Filed Jan. 17, 1975, Ser. No. 541,923

Int. Cl.² B60P 1/26

U.S. Cl. 298—23 B 9 Claims



1. An automatic tailgate release and latching mechanism for a vehicle-mounted dump bed having a swingable tailgate and at least one tailgate latch shiftable between a first position for holding said tailgate in a closed condition and a second position for releasing said tailgate to swing to an open condition, said mechanism comprising:

an elongate member mounted on said dump bed and rotatable about a horizontal, transverse axis;

apparatus interconnecting said member with the tailgate latch for shifting the latter from one to the other of said positions when said member is rotated; and

a device located on said vehicle proximal said dump bed for alternately rotating the member in opposite directions,

said device having structure normally disposed in the path of travel of said member as the latter passes thereby

during raising of the dump bed to engage the member for rotating the same in one direction to shift said latch to said first position during raising of the dump bed and to shift said latch to said second position during lowering of the dump bed,

said member including a trip arm fixedly attached thereto,

said structure intersecting the path of travel of said trip arm to deflect the same from one disposition to an alternate disposition as the dump bed is raised or lowered whereby said member is caused to rotate in a corresponding direction about is longitudinal axis in response to resistance encountered by said trip arm upon engagement of the same with said structure,

said structure including a pair of trip latches engageable by said trip arm, a first one of said pair of latches being positioned to deflect said trip arm from said one disposition to said alternate disposition during passage thereby as the dump bed is raised to cause said member to rotate in said one direction, a second one of said pair of latches being positioned to deflect said trip arm from said alternate disposition to said one disposition during passage thereby as the dump bed is lowered to cause said member to rotate in said opposite direction.

said trip arm being oscillatable between said one disposition and said alternate disposition in response to the engagement with said trip latches as the dump bed is alternately raised and lowered,

there being an over-center crank arm assembly operably coupled with said member to snap across an overcenter point during movement of the trip arm from one of said dispositions to the other thereof for releasably holding said trip arm in either of said dispositions.

3,958,830

LONGWALL MINING SYSTEM AND ARCHSHIELD FOR MINING TAR SANDS, OIL SHALES AND THE LIKE

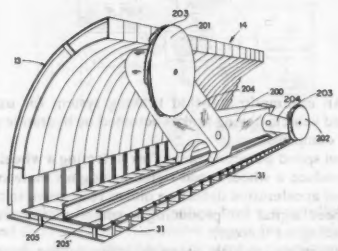
Robert W. Johns, Calgary, Canada, assignor to World Oil Mining Ltd., Calgary, Canada

Filed Sept. 26, 1974, Ser. No. 509,489

Claims priority, application Canada, Mar. 18, 1974, 195228

Int. Cl.² E21C *27/24*, *29/02*

U.S. Cl. 299—31 **32 Claims**



1. A mining system including a mining shield comprising:

a. a plurality of arch sections in side by side abutting relationship forming a tunnel like chamber having a bottom and a side wall and being open opposite said side wall toward the mining wall,

b. said arch sections each having a base portion and an arcuate cantilever portion extending upwardly at a generally acute angle from said base portion,

c. each of said arch sections being independently movable in the direction of the base member,

d. whereby the base portions of said arch sections form said bottom, and said cantilever portions of said arch sections forms said side wall,

e. rail means positioned on said bottom, and

f. a mining machine mounted on said rail means for travel therealong.

3,958,831

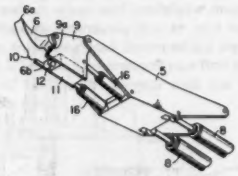
TUNNEL EXCAVATOR

Hachiro Nakashima; Suichiro Miwa; Hiroshi Yanahara; Masakazu Yoshida, and Minoru Matsumoto, all of Osaka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 28, 1974, Ser. No. 473,895

Int. Cl.² E21D *9/10*; E21C *33/00*

U.S. Cl. 299—64 **2 Claims**



1. An excavator, for excavating a tunnel, comprising a body; a horizontally and vertically swingable boom mounted on said body; a first cylinder-piston assembly means arranged between said body and said boom for horizontally and vertically swinging said boom; a swingable bracket pivotally mounted on the forward end portion of said boom; a second cylinder-piston assembly means arranged between said bracket and said boom for swinging said bracket with respect to said boom; a vertically tiltable excavating cutter having a sharp tip at its forward end portion pivotally mounted on said bracket such that said bracket is forced upward and downward by said second cylinder-piston assembly means arranged between said bracket and said boom while said boom is held stationary; and power operator impact means arranged between said cutter and said bracket for intermittently applying an impact force to said cutter; raised ridge means formed on each side of said cutter opposite the side edges of said bracket for bearing the excavating reactional force applied to said cutter during excavation; a gathering means for gathering materials excavated by said excavator, and a transporting means for transporting the materials gathered by said gathering mean to the rear of said excavator discharging said materials.

3,958,832

DRUM MINING HEAD WITH CUTTER PATTERN

Siegfried Sigott, and Hubert Schwelberger, both of Zeltweg, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria

Continuation of Ser. No. 374,384, June 28, 1973. This application Mar. 12, 1975, Ser. No. 557,881

Claims priority, application Austria, June 30, 1972, 5635/72

Int. Cl.² E21C *27/24*

U.S. Cl. 299—89 **4 Claims**

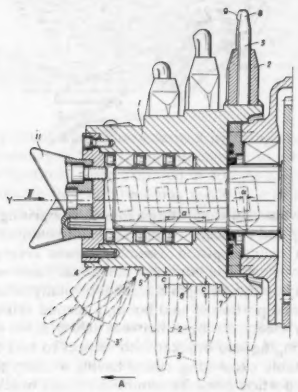
1. In a mining machine having a jib arm, a rotary mining head (15) mounted on said jib arm for rotation about an axis of rotation (Y), means for rotating said rotary mining head about said axis of rotation, and means for advancing said jib arm in a swivelling movement in a direction (A) along said axis of rotation, said rotary mining head comprising:

a. a body portion (1),

b. a plurality of cutter bits (3) carried by said body portion and extending generally radially from said body and each having a free end, each of said cutter bits having an angle of inclination (α) with respect to said body,

c. a plurality of groups of cutter bits, each group composed of a plurality of cutter bits, (41–45, 46–50, 51–55) each group being spaced along the axis of rotation (Y) of said cutter bits from the other groups, and the free ends of the cutter bits of each of said groups defining a circle, the circles defined by the free ends of the cutter bits of said groups increasing in diameter (Q, R, S) in the axial direction towards attachment of said body to the jib arm,

d. said cutter bits groups and said cutter bits within said groups being arranged so that the relationship $a = \tan \alpha$ γ is fulfilled, wherein a = the measured axial distance between two adjacent groups, α = the angle of inclination of each of the cutter bits the ends of which are situated



on the circle of larger diameter of the adjacent groups, and γ = the length of the arc described by the free end of each of the cutter bits over the angle (β) by which each of said cutter bits lags behind the cutter bit of the previous group the path of which it enters, and

e. each of said cutter bits having a cutting face (9), said cutting faces being positioned substantially normal to the direction of the resultant (R) of (i) the velocity component (V_r) imparted to the free ends of the cutter bits by rotation of the mining head in the direction of rotation, (r), and (ii) of the advance velocity component (V_A) imparted to the rotary mining head due to the velocity component of the head in the direction (A) of said axis of rotation.

3,958,833

HEAT SHIELD AND DRIVE KEY APPARATUS FOR DISC BRAKE

George E. Stanton, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Oct. 29, 1974, Ser. No. 518,316

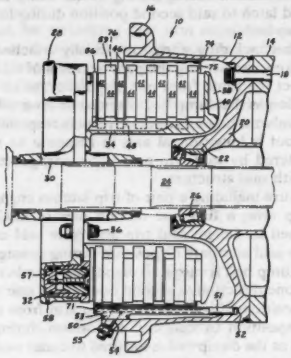
Int. Cl.² A63C 17/12

U.S. Cl. 301—6 A **13 Claims**

1. Heat shield and drive apparatus for a wheel surrounded disc brake having a plurality of interleaved non-rotatable stator discs and rotatable rotor discs wherein the rotor discs are connected to and driven by the wheel through axially extending key-slot means, said apparatus comprising:

an annular band concentric with said rotor and stator discs and slidable axially thereover to provide a shield between said wheel and said rotor and stator discs radially inward therefrom;

said annular band including a plurality of circumferentially spaced apart axially extending drive means slidably engageable with said key-slot means and providing a drivable connection therebetween.



3,958,834

AUTOMATIC ANTI-SKID BRAKING SYSTEM

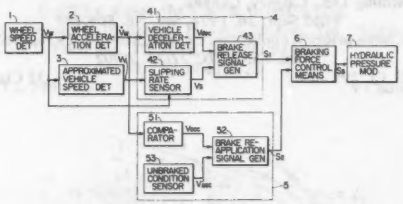
Yasuhisa Takeuchi; Haruhiko Iizuka, both of Yokosuka, and Mitsuhiko Ezoe, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed July 15, 1974, Ser. No. 488,413

Claims priority, application Japan, July 16, 1973, 48-79338; Mar. 13, 1974, 49-28859

Int. Cl.² B60T 8/02

U.S. Cl. 303—21 BE **1 Claim**



1. An automatic anti-skid braking system for use with a wheeled vehicle having brakes actuated by hydraulic pressure, which comprises:

wheel speed detecting means for detecting a wheel speed to produce a wheel speed signal analogous thereto;

wheel acceleration detecting means responsive to the wheel speed signal for producing a wheel acceleration signal analogous thereto;

approximated vehicle speed detecting means responsive to the wheel speed signal for producing a first approximated vehicle speed signal;

a braking force release unit responsive to the first approximated vehicle speed signal and the wheel acceleration signal for producing a brake release signal both when the wheel acceleration exceeds a given thershold value and a slipping rate exceeds a given threshold value;

a braking force re-application unit responsive to the wheel acceleration signal for producing a brake re-application signal when the wheel acceleration drops below a predetermined threshold value; and braking force control means responsive to the brake release signal and the brake re-application signal for producing a braking force control signal to control solenoid valves of a hydraulic modulator;

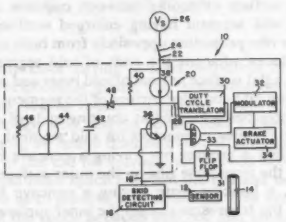
said braking force re-application unit comprising a first comparator circuit responsive to the wheel acceleration signal for producing a first acceleration output signal when the wheel acceleration exceeds a first set value; unbraked condition sensing means responsive to the wheel acceleration signal for sensing an unbraked condition when a wheel re-application is below a predetermined threshold value after releasing of the braking force and producing a second acceleration output signal in response thereto and brake reapplication signal generating means responsive to at least one of said first and second acceleration output signals for producing the brake re-application signal, in which said unbraked condition sensing means comprises: a timer circuit responsive to the braking force control signal from the braking force control means for producing a time-delayed output signal after a predetermined time delay; a second comparator circuit responsive to the wheel acceleration signal for producing an output signal when the wheel acceleration is below a second set value; and an AND circuit responsive to said time-delayed output signal from said timer circuit and said output signal from said second comparator circuit for producing said second acceleration output signal, and in which said timer circuit comprises: a first inverter for inverting the braking force control signal to produce a first inverted signal; a mono-stable multivibrator responsive to the braking force control signal to produce an output signal; and a second inverter for inverting said output signal from said mono-stable multivibrator to produce a second inverted signal whereby said first and second inverted signals are fed to said AND circuit together with said second acceleration output signal to produce the second acceleration output signal.

3,958,835

ADAPTIVE BRAKING CONTROL CIRCUIT

Ralph W. Rothfusz, and Bruce E. Latvala, both of Elyria, Ohio, assignors to The Bendix Corporation, South Bend, Ind.

Filed Dec. 9, 1974, Ser. No. 530,785
Int. Cl.² B60T *8/00*
U.S. Cl. 303—21 P **9 Claims**



1. In a vehicle having a wheel, a brake controlling said wheel, and fluid pressure responsive means for actuating said brake, an adaptive braking system controlling communication to said fluid pressure responsive means comprising:

speed sensing means for generating a speed signal proportional to the rotational velocity of said vehicle wheel;

skid detecting means responsive to said speed signal for generating a skid detecting signal when an incipient skidding condition of said wheel is detected and terminating said skid detecting signal when the incipient skidding condition terminates;

signal modifying means responsive to the output of said skid detecting means for generating a brake pressure control signal; and

modulator means responsive to said brake pressure control signal for communicating fluid pressure levels to said fluid pressure responsive means in accordance to the value of said brake pressure control signal;

said signal modifying means including first means responsive to generation of said skid detecting signal for generating a value of said brake pressure control signal causing said modulator means to decay the braking pressure communicated to said fluid pressure responsive means, said first means further including second means responsive to termination of said skid detecting signal for generating a value of said brake pressure control signal initiating a brake pressure build cycle causing said modulator means to increase braking pressure at a predetermined rate less than the maximum rate of increase permitted by the modulator during at least a portion of said build cycle;

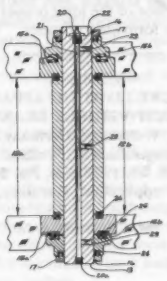
said second means being responsive to actuation of the brakes of the vehicle to generate an intermediate signal which increases in a predetermined manner during increase of braking pressure and which decreases in predetermined manner when said modulator means decays the braking pressure communicated to said actuators, said first means inhibiting said intermediate signal until said build cycle is initiated whereupon said first means equates the value of said control signal with the value of said intermediate signal.

3,958,836

MOVABLE TRACK ASSEMBLY FOR DRIVE TRACKS

Cicero C. Brown, deceased, late of Houston, Tex., and by Joe R. Brown, executor, P.O. Box 19236, Houston, Tex. 77024

Filed Jan. 9, 1975, Ser. No. 539,918
Int. Cl.² B62D *55/00*
U.S. Cl. 305—14 **6 Claims**



1. An assembly for connecting adjacent segments of a track comprising:

a. eye means extending from said adjacent segments;

b. pin means extending through said eye means for pivotably securing said adjacent segments relative to said pin means and to each other;

c. lubrication passage means extending through said pin means for communicating lubricant to the wear surfaces between said pin means and said eye means in each of the joined segments in said assembly;

d. sealing means enclosing at least a portion of the body of said pin means for retaining said lubricant in position on the portion of said wear surfaces included within said sealing means; and

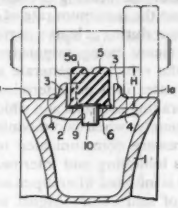
e. releasable securing means for releasably securing said pin means within said eye means whereby said securing means may be removed to separate said segments.

3,958,837

IDLER

Chikashi Chagawa, Hirakata, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed July 2, 1974, Ser. No. 485,230
Claims priority, application Japan, Feb. 25, 1974, 49-21708
Int. Cl.² B62D 55/14
U.S. Cl. 305—21 4 Claims



1. An idler for use in an endless track unit, comprising the combination of:

a. an idler proper having an annular groove formed at an intermediate portion of the outer peripheral surface thereof, and

b. a plurality of shock-absorbing member units, each being interchangeably secured into said annular groove by a bolt which is inserted thereinto and threadingly engaged with said idler proper, and each having a shock-absorbing member, a mounting plate fixedly secured to the inner peripheral surface of said shock-absorbing member and a positioning pin fitted into a positioning hole formed in said annular groove,

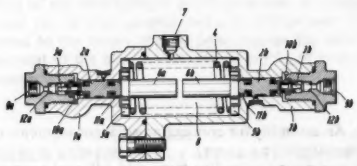
wherein said annular groove is projected vertically beyond the outer peripheral surface of the idler proper and is bounded by side walls thereat to form step portions.

3,958,838

BRAKE PRESSURE LIMITING APPARATUS FOR A DUAL-CIRCUIT VEHICLE BRAKE SYSTEM

Manfred Totschnig, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Jan. 27, 1975, Ser. No. 544,290
Claims priority, application Germany, Jan. 28, 1974, 2403855
Int. Cl.² B60T 8/18
U.S. Cl. 303—22 R 7 Claims



1. Brake pressure limiting apparatus for a dual-circuit vehicle brake system comprising, in combination:

a. a first and a second valve body arranged on a common axis;

b. the first valve body having a first inlet adapted for connection with a master cylinder and at least one first outlet for supplying braking pressure in said brake system;

c. the second valve body having a second inlet adapted for connection with a master cylinder and at least one second outlet for supplying braking pressure in said brake system;

d. a first valve element arranged within said first valve body, said first valve element being movable along said common axis between an open position, in which the pressure at said first inlet is transmitted to said first outlet, and a closed position isolating the pressures at said first inlet and first outlet;

e. a second valve element arranged within said second valve body, said second valve element being movable along said common axis between an open position, in which the pressure at said second inlet is transmitted to said second outlet, and a closed position isolating the pressures at said second inlet and second outlet; and

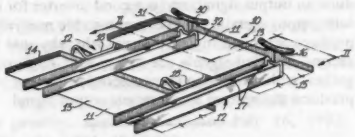
f. common actuating means, arranged between said first and second valve bodies, for simultaneously and equally applying an actuating force to said first and second valve element causing said first and second valve element to close when the pressure at said first and second inlets, respectively, exceeds a limiting value that is dependent upon the vehicle load.

3,958,839

SEGMENTED TRACK

John H. Nodwell, Calgary, Canada, assignor to Foremost International Industries Ltd., Calgary, Canada

Filed Feb. 18, 1975, Ser. No. 550,386
Int. Cl.² B62D 55/18
U.S. Cl. 305—35 R 1 Claim



1. A vehicle track comprising a pair of longitudinally extending, spaced parallel belts joined by a plurality of transversely extending grouser bar assemblies, each belt being formed by a plurality of segments joined in end-to-end relationship, each segment being a generally flat moulded elastomeric body defining an inner surface and an outer ground engaging surface extending between opposite ends of said segment, said segment having enlarged sections to provide transverse ribs projecting oppositely from both said inner and outer surfaces adjacent the ends of said segment, each rib providing a flat surface normal to said inner and outer surfaces and forming said end edge surface of the segment, said grouser bar assembly being located at abutting ends of adjacent segments and forming connectors for said segment, each assembly including a grouser bar having a concave inner surface overlying the transverse ribs on the outer surfaces of abutting segments, a backing plate having a concave inner surface overlying the transverse ribs on the inner surfaces of abutting segments, and bolt means drawing said grouser bar and backing plate together, said flat surface forming said end edge surface being interrupted across the width of the segment with a plurality of openings of semicircular cross-section and extending perpendicular to said flat body, said openings when matched with like openings in an adjacent segment providing circular bores for said bolt means.

3,958,840

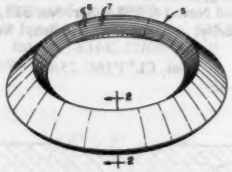
FLEXIBLE BEARING HAVING REINFORCEMENTS

Charles C. Hickox, Brigham City, and J. Donald McGregor, Logan, both of Utah, assignors to Thiokol Corporation, Newtown, Pa.

Filed May 5, 1975, Ser. No. 574,673
Int. Cl.² F16C 7/00
U.S. Cl. 308—2 A 9 Claims

1. In a flexible bearing comprising alternate layers of elastomer and rigid material, stacked and bonded together, the improvement comprising:

at least one layer of open-weave, reinforcing material embedded in at least one layer of elastomer, so that the



elastomer may extend through the openings in the weave to encapsulate each strand thereof.

3,958,841

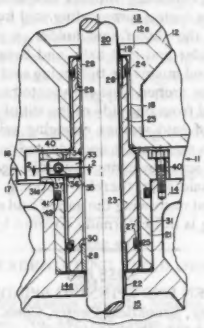
NON-FRICTION PRESSURE SEAL

Anton Braun, 6421 Warren Ave., Minneapolis, Minn. 55435

Filed Feb. 21, 1975, Ser. No. 551,772

Int. Cl.² F16C *17/00*

U.S. Cl. 308—3.5 **14 Claims**



1. In a compressor having at least two areas of different pressures a reciprocable piston rod extending between and into each area, sealing means comprising a wall with a long bore therethrough with respect to the bore's diameter with said bore having an inside diameter only slightly larger than the diameter of the rod for surrounding the rod between said areas with a gas filled space between the rod and bore in the compressor so as to prevent substantial gas flow between the areas through the space between said rod and bore.

3,958,842

RADIAL MAGNETIC BEARING

George R. Telle, El Segundo, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 3, 1975, Ser. No. 546,485

Int. Cl.² F16C *39/00*

U.S. Cl. 308—10 **10 Claims**

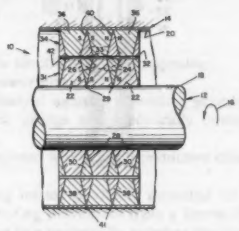
1. A radial magnetic bearing comprising:

a shaft having a circumferential surface and a housing having an inner cylindrical surface substantially centered about and spaced from said circumferential surface;

a first plurality of axially magnetized ring magnets secured to said circumferential surface of said shaft and being axially terminated in faces for defining magnetic poles, in which like poles of adjacent ones of said magnets face one another, said like pole faces of said adjacent magnets being sloped away from one another for defining means for defining a configuration of substantially triangular openings converging substantially at said circumferential surface;

a first plurality of substantially triangularly-shaped ferromagnetic rings positioned in said triangular openings means and secured to said sloped pole faces, in which said ferro-magnetic rings have bases of sufficient width for preventing saturation thereof, for providing a flux path tangential to said circumferential surface for thereby smoothing out any non-uniform magnetization of said magnets, and for minimizing back leakage flux at said circumferential surface;

a second plurality of axially magnetized ring magnets secured to said inner cylindrical surface of said housing and being axially terminated in faces for defining magnetic poles, in which like poles of adjacent ones of said magnets face one another, said like pole faces of said adjacent magnets being sloped away from one another for defining means for defining a configuration of substantially triangular openings converging substantially at said inner cylindrical surface, said like poles of said second plurality of axially magnetized ring magnets being radially aligned with said like poles of said first plurality of axially magnetized ring magnets for radially repelling said first and second plurality of magnets from one another and thereby for centering of said shaft with respect to said housing; and



a second plurality of triangularly-shaped ferro-magnetic rings positioned in said triangular openings means of said second plurality of magnets and secured to said sloped pole faces thereof, in which said ferro-magnetic rings have bases of sufficient width for preventing saturation thereof, for providing a flux path tangential to said inner cylindrical surface for thereby smoothing out any non-uniform magnetization of said second plurality of said magnets, and for minimizing back leakage flux loss at said inner cylindrical surface.

3,958,843

SPINNING SPINDLE ASSEMBLY

Dieter Widmer, Uerikon, Zurich, Switzerland, assignor to Spindel-Motoren-und Maschinenfabrik A.G., Uster, Switzerland

Filed Sept. 13, 1974, Ser. No. 505,641

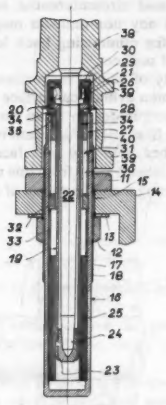
Claims priority, application Germany, Sept. 28, 1973, 2348908

Int. Cl.² F16C *17/08, 23/08, 27/08, 35/12*

U.S. Cl. 308—152 **11 Claims**

1. A spinning spindle assembly comprising a bearing housing, a bearing tube arranged in said bearing housing, first and second spaced bearings mounted in said bearing tube, a spindle shaft rotatably mounted in said bearings, at least one rigid portion of the bearing housing whereby the bearing housing may be clamped, driven means on said spindle shaft and extending around said first bearing whereby the spindle may be driven substantially adjacent said first bearing, first resilient means as part of said spinning spindle assembly allowing resilient tilting and hence wobble of said first bearing and said bearing tube, damping means interposed between said bearing

housing and said bearing tube for counteracting and damping the tilting and wobbling movement of said bearing tube, and second resilient means spaced from said first resilient means



as part of said spinning spindle assembly allowing lateral displacement of said first bearing in a direction substantially at right angles to the longitudinal axes of said spindle shaft.

3,958,844

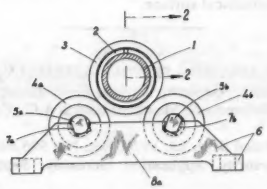
BEARINGS FOR RAPPING SHAFT FOR ELECTROSTATIC PRECIPITATORS

Xaver Johann Huppi, Zurich, and Alfred Frauenfelder, Zollikon, both of Switzerland, assignors to American Air Filter Company, Inc., Louisville, Ky.

Filed May 23, 1975, Ser. No. 580,203

Int. Cl.² F16C *35/02*

U.S. Cl. 308—24 **6 Claims**



1. A bearing assembly comprising: two spaced bearings each supported by an elongated rod member mounted in spaced relation in a bearing block, said bearing block including a U-shaped cradle with a pair of rod member receiving means therein, the rod member receiving means including slots in each of the vertically extending legs of the U-shaped cradle, said slots being in spaced alignment, the rapping shaft including a wear ring on the outer periphery thereof, the wear ring being detachably mounted to said shaft and disposed in contacting relationship with said bearings.

3,958,845

TIGHTENING OF BALL BUSHES

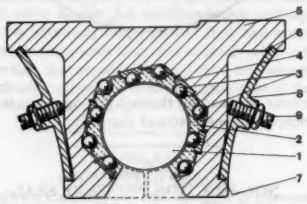
Sven Walter Nilsson, Partille, Sweden, assignor to SKF Nova A.B., Goteborg, Sweden

Filed Nov. 14, 1974, Ser. No. 523,756

Claims priority, application Sweden, Nov. 22, 1973, 7315787

Int. Cl.² F16C *25/00*

U.S. Cl. 308—65 **5 Claims**



1. A ball bush unit of a type having a number of races and adapted to move linearly on an axle, comprising a holder having an axially extending slit and adapted to partially surround said axle, a casing surrounding said holder and having a slit lined with the slit of said holder, a plurality of balls between said holder and said axle, and between said holder and said casing, and means for tightening said bush unit on the axle comprising an arched washer mounted externally on said casing and spaced from one side of the slit of said casing, with opposite edges of said washer engaging said casing, and a screw threaded in said washer and adapted to engage a side of said casing, said screw pressing inwardly against said casing with respect to said axle, thereby reducing the arch of said arched washer and narrowing the gap of said slit, whereby said slit of said casing is not externally covered by said washer.

3,958,846

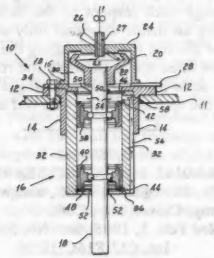
OPEN END SPINNING SPINDLE

William E. Donner, Brookfield Center, Conn., assignor to The Barden Corporation, Danbury, Conn.

Filed June 6, 1975, Ser. No. 584,646

Int. Cl.² F16C *35/08*

U.S. Cl. 308—149 **12 Claims**



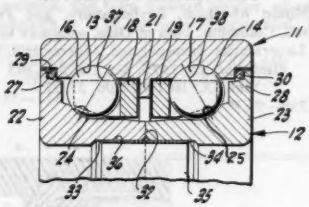
1. A shaft and bearing assembly for an open-ended spinning unit including in combination, a unitary bearing housing, a bearing, means mounting said bearing in said housing at a location spaced from an end of said housing, a shaft supported in said bearing and extending through said housing end, and an air flow restrictor surroundng said shaft adjacent to said housing end to form a space between said restrictor and said bearing, one of said housing and said shaft being formed with a low resistance air bypass passage leading from outside said housing into said space.

3,958,847

BEARING ASSEMBLY

Earl S. Cain, Portola Valley; Jerome A. Carlson, Woodside, and George E. Goodrich, San Carlos, all of Calif., assignors to Tribotech, Redwood City, Calif.

Filed Jan. 31, 1975, Ser. No. 545,764
Int. Cl.² F16C 13/00, 33/00
U.S. Cl. 308—196 14 Claims



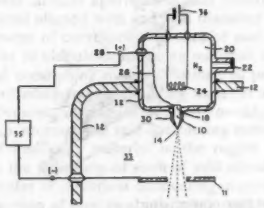
1. In an anti-friction bearing assembly, an inner race ring, an outer race ring, a plurality of circumferentially spaced bearing elements carried between the rings, at least one of said rings comprising a pair of complementary split ring segments which are in facing relationship along a radially extending plane, and flexible elongate locking strip means positioned about a circumference of the ring segments on the opposite sides of the radially extending plane for holding each of said ring segments against relative axial and rotary displacement with respect to each other, said ring segments and locking strip being substantially unrestrained radially whereby the ring segments are free to undergo a limited range of relative radial displacement.

3,958,848

METHOD OF FABRICATING FIELD DESORPTION ION SOURCE

Hans W. Heil, 380 Rambla Orienta, Malibu, Calif. 94035

Division of Ser. No. 481,785, June 21, 1974, Pat. No. 3,911,311. This application Mar. 31, 1975, Ser. No. 563,798
Claims priority, application Germany, July 3, 1973, 2333866
Int. Cl.² H01J 9/02
U.S. Cl. 316—26 3 Claims



1. A method of fabricating a gas permeable electrode comprising the steps of

etching the end of a gas permeable wire to a point,

covering said etched end of said wire with a gas impervious coating,

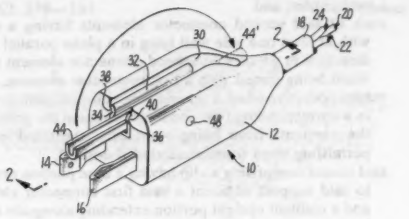
applying an electrical potential to said etched and coated wire in an evacuated space until the coating on said point is removed by field evaporation.

3,958,849

ELECTRICAL PLUG

Donald A. Blairsdale, 1622 Michael Drive, Pinole, Calif. 94564

Continuation of Ser. No. 469,074, May 13, 1974. This application Mar. 4, 1975, Ser. No. 555,222
Int. Cl.² H01R 3/06
U.S. Cl. 339—14 P 7 Claims



1. A convertible electrical plug, comprising:

a plurality of power prongs;

a conductive channel member extending generally parallel to said power prongs and electrically connected to a ground wire;

pivot means disposed within said conductive channel member;

grounding prong means pivotably mounted on said pivot means for pivoting movement from a forwardly pointing active position to a rearwardly pointing inactive position, said grounding prong means being aligned with said conductive channel member in both of said positions; and

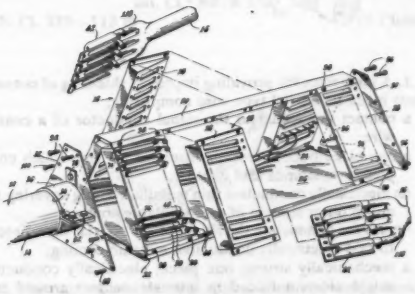
retaining means for retaining said grounding prong means in either of said two positions and for pressing said grounding prong means against the interior of said conductive channel member to electrically connect said grounding prong means to said ground wire wnen it is in said active position.

3,958,850

METHOD AND APPARATUS FOR CONNECTING MULTI-CONDUCTOR CABLES

George Edward Ayer, Endicott, N.Y., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

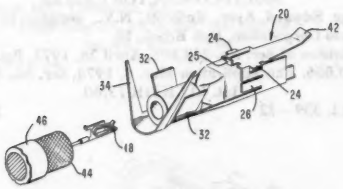
Division of Ser. No. 248,595, April 28, 1972, Pat. No. 3,820,056. This application Mar. 6, 1974, Ser. No. 448,476
Int. Cl.² H01R 13/60
U.S. Cl. 339—22 2 Claims



1. An assembly for physically and electrically connecting a first multi-conductor cable to one or more second mutli-conductor cables comprising:

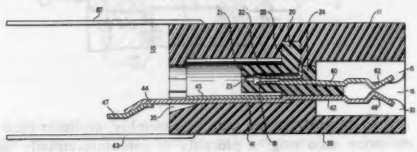
a support;
a plurality of first connector elements mounted thereon, each of said connector elements having a selected group of first cable conductors physically and electrically connected thereto;
a plurality of second connector elements adapted to mate with said first connector elements, each of said second connector elements being physically and electrically connected to a selected group of conductors of said second cables; and
each of said second connector elements having a casing with at least one side wall lying in a plane parallel to the direction in which said second connector element moves when being mated with a first connector element,
means operative when a second connector element is mated in a corresponding first connector element for preventing the elements from being spuriously separated but for permitting them to be separated if desired,
said means comprising a clip having a base portion attached to said support adjacent a said first connector element, and a resilient upright portion extending alongside said at least one side wall of a second connector element when said second connector element is in mated relation with the corresponding first connector element, said upright portion having a cam surface inclined relative to said said wall, whereby said upright portion is acted upon by said second connector element to move said upright portion aside as said connector elements are being moved from unmated into mated relation, said upright portion further having a projection extending toward said side wall, and said side wall having a detent recess, said projection being snapped into said recess by the resilience of said upright portion when said connector elements are moved into fully mated relation.

3,958,851
SHIELDED CONNECTOR
Robert T. Evans, Poughkeepsie, N.Y., assignor to IBM Corporation, Armonk, N.Y.
Filed Dec. 30, 1974, Ser. No. 537,231
Int. Cl.² H01R 17/08
U.S. Cl. 339—47 R **7 Claims**



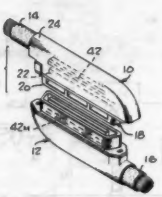
1. A connector for providing improved shielding of connections made in coaxial type wire comprising;
a contact connected to the signal conductor of a coaxial wire;
a one piece hermaphroditic insulator housing which completely surrounds said contact;
an electrically conductive thin metallic coating covering the entire outer surface of said insulator housing;
means for connecting the shield of the coaxial wire directly to said electrically conductive metallic coating;
a mechanically strong, one piece, electrically conductive shield element folded in intimate contact around said metallic coated one piece insulator so as to provide a low resistance electrical path therebetween;
means for connecting said electrically conductive shield element to the shield of the coaxial wire to form a mechanical and electrical connection therebetween;
further means for connecting said electrically conductive shield element to the outside of said coaxial wire forming a strain relief therewith;
means forming part of said mechanically strong, one piece, electrically conductive element for applying the compliant mechanical forces to maintain intimate contact of metallized insulators when mated.

3,958,852
ELECTRICAL CONNECTOR
Gerald Milton Abraham, Reynoldsburg, and Peter John Campbell, Columbus, both of Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Apr. 15, 1975, Ser. No. 568,303
Int. Cl.² H01R 17/06, 27/02
U.S. Cl. 339—91 P **10 Claims**



1. An electrical connector comprising:
a housing having an opening;
a ground plane mounted within the housing;
a plurality of coaxial jacks mounted in the housing, each jack having a conductive tubular element which is connected to the ground plane and a conductive socket which is mounted inside the tubular element;
a first plurality of contact springs, each spring having a first end connecting to the ground plane and a second end extending into the opening; and
a second plurality of contact springs, each spring having a first end connecting to a different socket of one of the coaxial jacks and a second end extending into the opening.

3,958,853
CONNECTOR
Robert Everett Wilson, Agoura, Calif., assignor to Viking Industries, Inc., Chatsworth, Calif.
Filed Dec. 12, 1974, Ser. No. 531,924
Int. Cl.² H01R 13/38
U.S. Cl. 339—99 R **6 Claims**



1. A connector comprising:
a frame;
a plurality of electrical contact elements mounted on said frame in a row configuration thereon, each of said elements having an upstanding wire-receiving portion with a slot for receiving an insulated wire and cutting through the insulation to contact the core of the wire;
a carrier of insulative material having a row of slots for receiving the insulated wires, said carrier having retention means for holding the carrier to said frame with said slots in said carrier being aligned with said slots in said contact elements; and

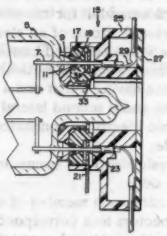
a plurality of insulated wires disposed in said slots of said carrier, said slots of said carrier being slightly narrower than said wires so that the wires are held in an interference fit therein.

3,958,854

SPARK GAP APPARATUS

William Lee Arrington; Robert Dwight Gantt; Thomas Edward Gausman, and Glen Edward Snyder, all of Batavia, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 2, 1974, Ser. No. 511,449
Int. Cl.[2] H01J 19/66; H01R 23/52
U.S. Cl. 339—111 2 Claims



1. A spark gap socket for an electron discharge device having a circular array of circular pins comprising:

a wafer of electrical insulating material having a plurality of circumferentially spaced circular apertures aligned with and formed to telescope over said circular array of circular pins of said electron discharge device;

a wafer of electrical conducting material having a plurality of circumferentially spaced circular apertures with each one of said circular apertures of said electrical conducting material aligned with and of a diameter greater than the diameter of corresponding ones of said apertures of said wafer of electrical insulating material, said wafer of electrical conducting material formed to provide an air gap intermediate said conducting material and each one of said circular pins of said electron discharge device and an air gap intermediate said conducting material and said wafer of insulating material in the region immediately adjacent the periphery of each of said circular apertures in said wafer of electrical conducting material; and

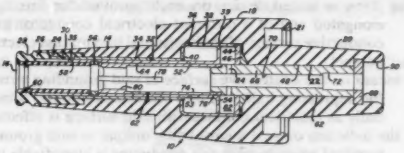
a socket portion of electrical insulating material affixed to said wafers of electrical insulating and conducting materials and having a portion thereof spaced from said wafer of electrical conducting material to provide an air gap in the region immediately adjacent the periphery of each of said apertures in said electrical conducting material and intermediate said socket portion and said wafer of electrical conducting material, said socket portion including a hole in each of said portions spaced from said wafer of electrical material with each hole having an electrical conductor therein formed to receive a circular pin of said circular array of said electron discharge device.

3,958,855

ELECTRICAL CONNECTOR

Lloyd Oakes, Kinston, N.C., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 409,901, Oct. 26, 1973, abandoned, which is a continuation of Ser. No. 215,729, Jan. 6, 1972, abandoned. This application Mar. 7, 1975, Ser. No. 556,106
Int. Cl.[2] H01R 13/52
U.S. Cl. 339—111 21 Claims



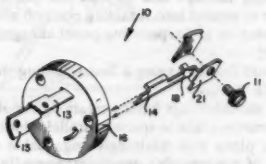
1. An electrical connector device comprising: an insulating housing means; an elongated first contact means located within said housing and having a contact receiving section at one end thereof accessible through a contact receiving opening in said housing means; an elongated second contact means having at least the external surface of a free end portion thereof of a material which produces a gas when subjected to an electrical arc and an electrically conducting portion axially adjacent said free end portion, said portions of said second contact means being insertable into said contact receiving opening upon relative coaxial movement of said first and second contact means towards each other, electrical shunt means located within said housing means comprising an elongated member axially slidable with respect to said first contact means and having a first segment in gaseous communication with said contact receiving section and a second segment adjacent said one end of said first contact means; said second segment being movable to a location axially outwardly of said one end of said first contact means and being in electrical communication with said first contact means in all relative positions thereof; and said second segment having a configuration to establish non-contacting electrical communication with said electrically conducting portion at said axially outward position.

3,958,856

ELECTRICAL WIRING DEVICE

Jerry Mayronne Presson, Trumbull, Conn., assignor to Harvey Hubbell Incorporated, Bridgeport, Conn.

Filed Aug. 15, 1975, Ser. No. 604,906
Int. Cl.[2] H01R 3/00
U.S. Cl. 339—113 R 15 Claims



2. The method of determining if an electrical wiring device having at least one normally nongrounded terminal and a normally grounded terminal has been correctly wired with electrical conductors, comprising the steps of:

inserting one end of each conductor into a different terminal,

electrically connecting one end of each conductor to the terminal in which the conductor is inserted,

impressing indicium unique to the grounding terminal into the end of the conductor substantially at the same time the conductor is being connected to the grounding terminal, whereby the connection of the conductor to the grounding terminal is distinguishable from the connection of the other conductor to the nongrounding terminal.

10. An electrical wiring device having at least two nongrounding and one grounding terminal for providing electrical terminations to different electrical conductors comprising:

a screw actuated device on each terminal for forcing an elongated end of a different electrical conductor and a conductive surface of each terminal into mutual electrical contact,

means on the conductive surface of said grounding terminal for impressing indicium into one conductor end substantially as electrical contact with said surface is effected,

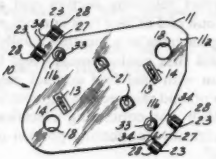
the indicium on said means being unique to said grounding terminal whereby said one conductor is identifiable upon removal thereof from the device terminals.

3,958,857

SNAP-IN ELECTRICAL CONNECTOR ASSEMBLY

Ronald L. Schultz, Northfield, and Stanley A. Linkowski, Franklin Park, both of Ill., assignors to Chromalloy-Alcon Inc., Chicago, Ill.

Filed Nov. 4, 1974, Ser. No. 520,471
Int. Cl.² H01R *13/48*
U.S. Cl. 339—128 **13 Claims**



1. In a snap-in electrical connector assembly comprising a dielectric body carrying thereon electrically conductive contact means, said body having a base surface for engagement with a supporting panel, the improvement comprising:

a plurality of spaced snap-in retaining fingers on said body projecting through and beyond the plane of said base surface to extend into retaining position alongside shoulder means on the supporting panel engaged by said base surface;

each of said fingers having a first retaining shoulder lug on one side thereof;

said first shoulder lugs having retaining shoulders disposed in a common plane in spaced parallel relation to said base surface plane and retainingly engageable with shoulder means of a supporting panel corresponding in thickness to the spacing between said first lug shoulders and said base surface plane; and

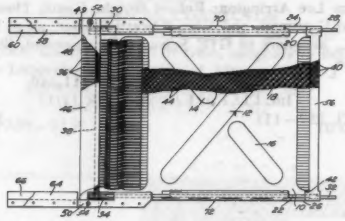
second shoulder lugs on another side of each of said fingers and having shoulders in a plane offset from said first lug shoulders and facing toward said base surface plane for engagement with shoulder means of a supporting panel of a thickness corresponding to the spaced relation of said second lug shoulders from said base surface plane.

3,958,858

MODIFIED CIRCUIT CARD EXTENDER

Robert J. Silveira, Jr., Raynham, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 10, 1975, Ser. No. 612,111
Int. Cl.² H01R *13/64*
U.S. Cl. 339—186 M **5 Claims**



1. A circuit card extender for transferring the electrical connections of a printed circuit of an electronic system from a chassis connector in a congested chassis area thereof to a convenient testing area which comprises:

an elongated frame having a first and a second longitudinal sides and a first and a second lateral sides;

a plurality of male electrical connectors mounted on said first lateral side;

a plurality of female electrical connectors mounted on said second lateral side;

means for connecting each member of said plurality of male electrical connectors to a corresponding member of said plurality of female electrical connectors;

a first elongated shaft rotatably mounted along said first longitudinal side of said frame;

a second elongated shaft rotatably mounted along said second longitudinal side of said frame;

keying means at both ends thereof for each of said first and second elongated shafts; and

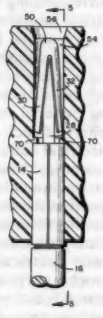
guiding means for coupling said frame to the chassis connector of the electronic system.

3,958,859

ELECTRICAL CONNECTOR PIN

Louis H. Schmid, 13581 Tea House Lane, Santa Ana, Calif. 93105

Filed June 17, 1974, Ser. No. 479,599
Int. Cl.² H01R *9/08*
U.S. Cl. 339—217 S **7 Claims**



1. An electrical connector for engaging use in combination with a tubular female mating member comprising:

A base member having a passage therein;

A pair of arms that have been formed from the branches of a Y shaped member with arm ends resiliently extending from the upright portion of the Y at the apex thereof in a manner wherein the arms are folded backwardly from the apex toward the upright of the Y in resiliently spaced relationship therefrom said arm ends free to move inwardly and outwardly with respect to the axis of the upright portion of the Y;

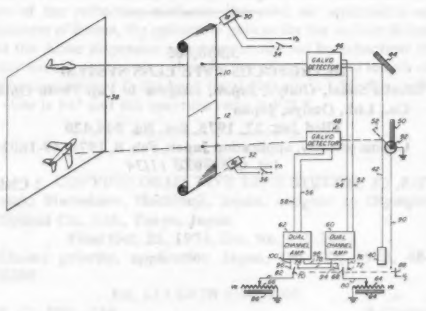
A wire connection means formed at the base of the upright of the Y member in spaced relationship from the apex thereof; and,

Means to prevent said member from longitudinal withdrawal movement within said passage in the form of a protuberance in said passage which engages the free ends of said arms in a manner so that they can be collapsed and passed over the protuberance.

3,958,860
HOLOGRAPHIC OBJECT RECOGNITION TRAINER

Denis R. Breglia, Altamonte Springs, and Alfred H. Rodemann, Maitland, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 9, 1974, Ser. No. 530,790
Int. Cl.² G03H *1/30*; G03B *21/00*
U.S. Cl. 350—3.5 **4 Claims**



1. A holographic object recognition trainer for selective visual display of an object as a real image at continuously variable attitudes comprising in combination:

a. first and second circularly cylindrical holographic films made in wrap-around 360° fashion about two axes of the object, the axes being normal to each other to store all views of the object as it rotates through 360° respectively about said two axes; two spaced rollers; said films being joined together and stretched between said rollers;

b. an *xy* optical scanner for each film, each scanner being positioned to scan an associated one of said films from an associated input laser beam;

c. a laser beam source for producing a laser beam;

d. a stationary reflector for passing said laser beam as an input laser beam to one of said optical scanners;

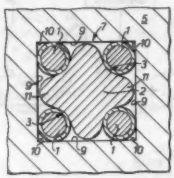
e. a movable reflector and associated actuator for moving said movable reflector into the path of said laser beam at a point to interrupt the passage of said laser beam to said stationary reflector and to pass the beam as an input laser beam to a second optical scanner;

f. an instructor's control panel including a pair of dual channel amplifiers and variable resistance switching circuits for applying selective analog voltages to said respective scanners to direct an input laser beam to an area of each hologram depicting a desired object attitude, said laser beam at said hologram films having a cross-sectional area which is small compared to the size of each hologram film, and also including switch means for actuating said movable reflector to switch said laser beam between said scanners as desired to select the one of said films on which the desired object attitude may be viewed.

3,958,861
DIELECTRIC OPTICAL WAVEGUIDES

Frederic Francis Roberts, London, England, assignor to The Post Office, London, England

Filed Nov. 26, 1974, Ser. No. 527,436
Claims priority, application United Kingdom, Dec. 13, 1973, 57812/73
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96 C **7 Claims**

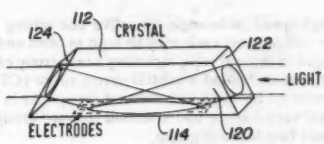


1. A joint between the ends of a pair of optical cables each of which includes an elastically - deformable core and a plurality of dielectric optical waveguides disposed circumjacent the core, said joint comprising a monolithic block having a guideway of polygonal cross-section, which extends through the block between two opposite end faces thereof and into which each of the cables extends from a respective end of the guideway, a portion at least of the core within the guideway being compressed transversely whereby each dielectric optical waveguide is urged by the core into a respective corner of the polygonal cross-section of the guideway and into engagement along two lines with the block, thereby positively locating the cable against movement within the guideway in a plane lying transversely to the cable axis, the ends of the optical cables within the block being so located that each dielectric optical waveguide of one of the cables is optically coupled with a respective dielectric optical waveguide of the other cable.

3,958,862
ELECTRO-OPTICAL MODULATOR

Marek Tadeusz Victor Scibor-Rylski, 14A Hawbush Rise, Welwyn, Hertfordshire, England

Filed June 14, 1974, Ser. No. 479,399
Int. Cl.² G02F *1/32*
U.S. Cl. 350—160 R **7 Claims**



1. An electro-optical modulator comprising:

a block of electro-optical material;

a source of light for providing a non-convergent beam of light directly to said block of material to travel through said block in a given direction to suffer a single internal reflection from one face of said block;

means for modulating said light beam including a pattern of interdigitated elongated electrodes on said one face of said block, the lengths of said electrodes extending in the

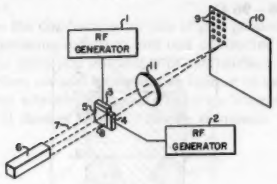
general direction of travel of said light beam, and means for applying a modulating voltage to said electrodes.

3,958,863

Tl_3TaS_4 AND Tl_3TaSe_4 CRYSTALS AND ACOUSTO-OPTICAL DEVICES

Thelma J. Isaacs, Murrysville, and Milton Gottlieb, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 10, 1975, Ser. No. 540,192
Int. Cl.² H01S 3/10; G02F 1/29
U.S. Cl. 350—161 26 Claims



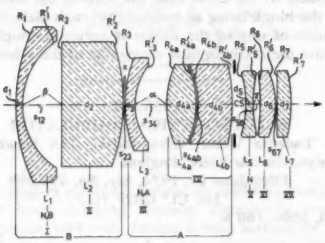
1. A single crystal selected from the group consisting of Tl_3TaS_4, Tl_3TaSe_4, and mixtures thereof, within ± 5% of stoichiometric, which is at least 3 mm long.

3,958,864

HIGH POWER PHOTOGRAPHIC OBJECTIVE WITH LARGE ANGULAR FIELD

Erhard Glatzel, Heidenheim, Brenz, Germany, assignor to Carl Zeiss Stiftung, Oberkochen, Germany

Filed Nov. 25, 1974, Ser. No. 527,090
Claims priority, application Germany, Nov. 28, 1973, 2359156; July 29, 1974, 2436144
Int. Cl.² G02B 3/04, 9/64
U.S. Cl. 350—189 31 Claims



1. A high-speed wide-angle objective comprising at least seven lens components each with air both in front and behind and arranged in three groups, including a rear group of at least three components behind a central vertex space (CS), and a forward member having a first forward group (A) in front of said central vertex space and a second forward group (B) in front of said first forward group,

said rear group having a negative component (N) of dispersing action, and a first positive component of collecting action behind said negative component and separated therefrom by an air space (γ) of diverging acton, and a second positive component of collecting action behind said first positive componennt and separated therefroom by an air space, said first and second positive components of said rear group each having a rear surface which is concave toward the front,

said first and second forward groups (A and B) of said forward member each comprising the combination of a meniscus shaped component (N, A and N, B) of diverging action which is convex toward the front, the meniscus shaped component in each of said forward groups being respectively followed by a positive component of collecting action behind its respective meniscus shaped component and separated therefrom by an air space, the axial thickness of each of these two air spaces (α and β) being within the limits of 0.22 times and 0.50 times the quivalent focal length (F) of the entire objective, and the sum of the axial thicknesses of both of said air spaces (α and β) being within the limits of 0.56 times and 0.83 times said equivalent focal length (F),

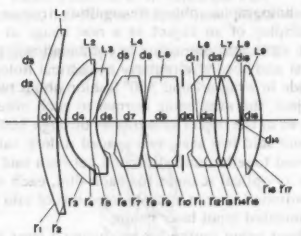
there being an air lens (x) of strongly collecting power between the front surface of said first forward group (A) and the rear surface of said second forward group (B), said front surface and rear surface bounding said air lens (x) being so dimensioned that the quotient (Q_e) of the sum of the surface powers (ϕ_x) of said air lens divided by the sum of the paraxial surface powers ($\phi_{N,A} + \phi_{N,B}$) of said two meniscus shaped components (N, A and N, B) of said first and second forward groups has a negative value within the limits −0.77781 and −1.54919, said front surface and rear surface bounding said air lens (x) also being so dimensioned that the quotient (Q_b) of said sum of the surface powers (ϕ_x) of said air lens divided by the paraxial surface power sum (ϕ_I) of the meniscus shaped negative component (N, B) of said second forward group (B) is within the limits of −1.76745 and − 2.81204.

3,958,865

RETROFOCUS TYPE LENS SYSTEM

Yutaka Sakai, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Jan. 27, 1975, Ser. No. 544,420
Claims priority, application Japan, Feb. 8, 1974, 49-16024
Int. Cl.² G02B 11/34
U.S. Cl. 350—214 2 Claims



1. A retrofocus type lens system comprising a positive meniscus lens L1 convex to the front as numbered consecutively from front to rear, two negative meniscus lenses L2 and L3 convex to the front, a positive meniscus lens L4 convex to the rear, a biconvex lens L5, a cemented negative lens component L6 and L7, a positive meniscus lens L8 convex to the rear, and a positive lens L9, wherein the following conditions are satisfied;

r_1	1.53019	d_1	0.12	N_1	1.60717	ν_1	40.2
r_2	3.40700	d_2	0.01				
r_3	0.55556	d_3	0.05	N_2	1.69350	ν_2	53.4
r_4	0.37037	d_4	0.18				
r_5	1.35156	d_5	0.04	N_3	1.69350	ν_3	53.4
r_6	0.49290	d_6	0.16				
r_7	−3.33333	d_7	0.20	N_4	1.64769	ν_4	33.9
r_8	−2.0000	d_8	0.01				
r_9	1.19210	d_9	0.24	N_5	1.72825	ν_5	28.3
r_{10}	−4.52667	d_{10}	0.11				
r_{11}	−1.96067	d_{11}	0.05	N_6	1.76182	ν_6	26.5
r_{12}	0.66973	d_{12}	0.12	N_7	1.77252	ν_7	49.6
r_{13}	1.60718	d_{13}	0.06				
r_{14}	−1.92023	d_{14}	0.10	N_8	1.62041	ν_8	60.3
r_{15}	−0.65381	d_{15}	0.01				
r_{16}	8.31732	d_{16}	0.14	N_9	1.51633	ν_9	64.0
r_{17}	−0.80733						

where r, d, N and ν, respectively, designate the radii of curvature of the refracting surfaces, the axial air separations or thickness of lenses, the refractive indices for the sodium d-line and the Abbe dispersion numbers numbered by subscripts in order from front to rear, whereby the effective focal length of the lens system is 1.0, the back focal distance is 1.56, the angle of view is 84° and the aperture ratio is F/2.8.

3,958,866
COPYING OBJECTIVE LENS SYSTEM

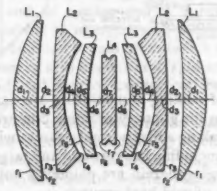
Masaki Matsubara, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1974, Ser. No. 518,196

Claims priority, application Japan, Oct. 27, 1973, 48-120388

Int. Cl.² G02B 9/64, 9/60

U.S. Cl. 350—214 **8 Claims**



1. A copying objective lens system comprising seven lenses arranged symmetrically on both sides of a stop positioned at the center of said lens system and arranged from both of the object side and image side in the order of first lenses, second lenses, third lenses and a fourth lens, said first lenses being positive meniscus lenses, said fourth lens being a biconvex lens having weak refractive power, and said copying objective lens system satisfying the following conditions:

$$(1)\ [n_1 > 1.7, \nu_1 > 40]\ 1.82 > n_3 > 1.75, 47 > \nu_3 > 40$$

$$(2)\ 0.2f < f_3 < 0.6f, f_3 < 0$$

$$(3)\ f < f_4 < 10f$$

wherein reference symbol n_1 represents the refractive index of the first lens, reference symbol ν_1 represents Abbe's number of the first lens, reference symbols f_3 and f_4 respectively represent focal lengths of the second and fourth lenses, and reference symbol f represents the focal length of the lens system as a whole.

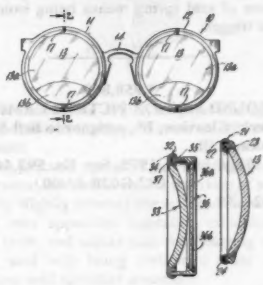
3,958,867
EYEGLASS STRUCTURE

J. Robert Morgan, Palmer Hill Road, Old Greenwich, Conn. 06870

Filed May 17, 1974, Ser. No. 470,715

Int. Cl.² G02C 7/00

U.S. Cl. 351—47 **4 Claims**



1. An eyeglass structure comprising an eyeglass frame including a pair of generally annular elements joined by a nose bridge, a pair of lens carrying elements overlying said annular elements, annular grooves in one pair of elements, annular ridge means of deflectable material carried by the other pair of elements, said ridge means on each of said other pair of elements removably engaging an annular groove in an element of said one pair of elements, said ridge means being in snap-fit rotatable relation thereto.

3,958,868
SOUND SYSTEM PINCH ROLLER ACTUATING DEVICE

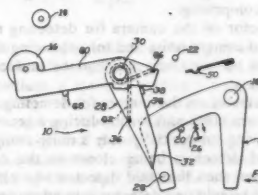
Yoshiaki Mizuki, Iruma, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha, Higashimurayama, Japan

Filed Mar. 10, 1975, Ser. No. 556,530

Claims priority application Japan, Apr. 4, 1974, 49-38510

Int. Cl.² G03B 31/02

U.S. Cl. 352—27 **5 Claims**



1. In a motion picture camera having a control trigger and a sound station at which sound is recorded on film simulaneously with images, the sound station including a capstan and a pinch roller for transporting film through the sound station, and improvement in a pinch roller actuating mechanism comprising:

a pinch roller control member pivotable about a fixed axis;

means carried by the control trigger for engaging said control member, and for moving same about said axis;

said pinch roller control member including a first controlling surface and a second controlling surface, the first controlling surface when engaged by said control trigger being an active portion for actuating said pinch roller into operative condition and the second controlling surface being a neutral portion for maintaining said pinch roller in operative condition;

a pinch roller support member actuatably by said control member for causing engagement of said pinch roller with the capstan responsive to actuation of said control trigger, and at a constant pressure isolated from the pressure applied to said control trigger; and

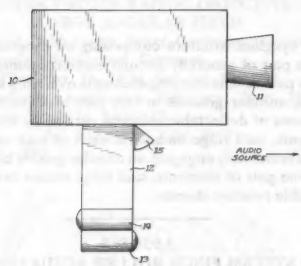
said pinch control member including a spring means for urging said pinch roller support member from a pinch roller and capstan engaged orientation when said control member is engaged and displaced by said control trigger toward a pinch roller and capstan disengaged orientation, the force of said spring means being isolated from said control trigger.

3,958,869

SOUND MOTION PICTURE CAMERA

James E. Beck, Glenview, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed July 2, 1975, Ser. No. 592,445
Int. Cl.² G03B *31/00*
U.S. Cl. 352—35 **7 Claims**



1. In a sound-movie motion picture camera of the type having a body which comprises a source of camera noise, a means for producing a substantially noise free audio intelligence signal comprising:

a first detector on the camera for detecting audio intelligence and camera noise and for producing a first electrical signal having audio intelligence and camera noise components;

a second detector on the camera for detecting substantially only camera noise and for producing a second electrical signal having substantially only a noise component;

one of said detectors being closer to the camera noise source than the other said detector whereby said signal produced by said one detector is in advanced phase relation to said signal produced by said other detector;

means for delaying said signal produced by said one detector to thereby provide first and second signals which are in phase;

means for inverting one of said in phase signals to thereby provide an inverted signal; and

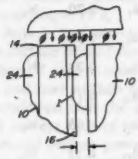
means for combining said inverted signal with the non-inverted in phase signal to thereby cancel said noise components and to produce a third signal which includes substantially only an audio intelligence component.

3,958,870

TACKED FILM ROLL AND METHOD OF MAKING SAME

Robert I. Edelman, Rochester; Willis L. Stockdale, Fairport; Robert A. Sylvester, Hilton, and Corrado Zollo, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 21, 1974, Ser. No. 499,381
Int. Cl.² G03C *1/76*
U.S. Cl. 352—37 **8 Claims**



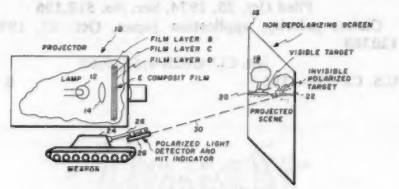
1. An elongate strip of photographic web material having first and second web faces, said first face having a raised stripe adjacent one longitudinal edge of said strip, said second face carrying a layer of meltable photosensitive emulsion said strip being wound to form a roll having a plurality of convolutions, the stripe of one convolution being temporarily adhesively bonded to the opposed second face of an adjacent convolution by localized melting of said emulsion layer to restrict relative movement between such convolutions.

3,958,871

COMPOSITE POLARIZED FILM FOR USE IN A WEAPON TRAINING SIMULATOR

Gottfried R. Rosendahl, and Windell N. Mohon, both of Winter Park, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 20, 1975, Ser. No. 588,987
Int. Cl.² G03B *19/18*
U.S. Cl. 352—39 **4 Claims**



1. A method of making and utilizing a specially polarized motion target film for gunnery practice comprising:

a. the step of making a first normal color movie film of a real world scene including background and target areas and in which all targets therein are painted a color uncommon to the colors of said background;

b. the step transferring the scene to a second film of the vectograph polarizing type while using a blocking filter for said uncommon color between the films in the transfer such that only the background scene is passed to said second film, the unexposed target areas appearing clear;

c. the step of again transferring the scene from said first film to a third film of the vectograph type while using a filter which passes only said uncommon color to render the target areas of image density and the background clear, said third film being of a type which polarizes upon exposure to a direction 90° from that of said second polarizing film;

d. the step of again transferring the scene from said first film to a fourth black and white film while using a filter rendering the appropriate gray value to the uncommon color

target areas to remove the uncommon color targets from the scene and cause them to blend in with the background properly;

e. the step of fixing together in registration said second and third and fourth films such that when projected as a three layered movie film the targets and background scenes are totally linearly polarized but in respective 90° out of phase relation; and

f. the step of utilizing a polarizing filter on a weapon affixed detector and in such position that it coincides with the target polarization and passes light that is linearly polarized from the targets when the weapon is trained on the non-visible polarized target.

3,958,872

MOTION PICTURE CAMERA WITH ELECTROMAGNETICALLY ACTUATED RELEASE

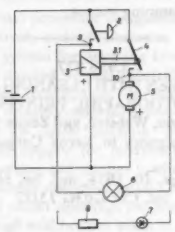
Johann Roth, Schwabhausen, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 7, 1974, Ser. No. 512,991

Claims priority, application Germany, Oct. 10, 1973, 2350738

Int. Cl.² G03B *21/50, 17/46*

U.S. Cl. 352—92 **4 Claims**



1. A motion picture camera for use in connection with a motion picture film, and comprising:

a. a drive circuit including a current source; an electric motor adapted for driving the film of the camera; and a normally open drive switch, said source, said motor and said drive switch being connected in series;

b. a release circuit including: a release magnet having an armature and an exciter coil; a normally open release switch operable to energize said exciter coil; said armature being coupled to said drive switch for closing it upon energization of said exciter coil, said source, said release switch and said magnet exciter coil being connected in series; and

c. a signal circuit connected between said drive circuit and said release circuit and including: an electro-optic indicator connected in parallel with said magnet exciter coil and in series with said motor, whereby said indicator lights up upon closing of said release switch and is adapted to produce a light mark on the film of the camera before the motor begins to drive the film.

3,958,873

STATIONARY SPROCKET GUARD ASSEMBLY

Arthur C. Mueller, Niles, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed June 9, 1975, Ser. No. 585,009

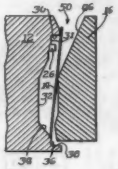
Int. Cl.² G03B *1/56*

U.S. Cl. 352—157 **11 Claims**

1. An easily threaded sprocket assembly for an apparatus for handling an elongated web having a row of perforations near one edge thereof, the sprocket assembly into which the web can be manually inserted and removed comprising:

a sprocket having a plurality of teeth spaced about the periphery thereof proximate one end for engaging the perforations in the web, said sprocket having spaced above said teeth an overhanging rim of greater diameter than the ends of said teeth, and having spaced below said teeth a recess of lesser diameter than said teeth, and an angled ledge extending from said recess to a plane substantially aligned with the root of said teeth; and

an arcuately configured stationary sprocket guard positioned adjacent said sprocket, and having an aligned



portion proximate said angled ledge of said sprocket and a keeper portion at the approximate middle of the height of the guard;

said sprocket and said sprocket guard being spaced apart a predetermined amount to enable insertion of a web therebetween by slightly bending the web and causing said web to move into apparatus operating condition on said sprocket teeth and under said overhanging rim of said sprocket, said web being restrained from inadvertent escape from said sprocket assembly.

3,958,874

PICTURE INFORMATION RETRIEVING SYSTEM

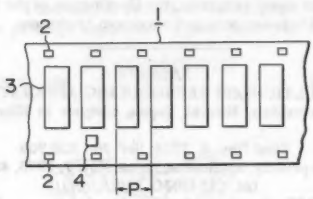
Shigeru Uchida, and Kanji Yamamoto, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 12, 1974, Ser. No. 460,477

Claims priority, application Japan, Apr. 13, 1973, 48-41293

Int. Cl.² G03B *23/12, 21/28*

U.S. Cl. 353—26 A **6 Claims**



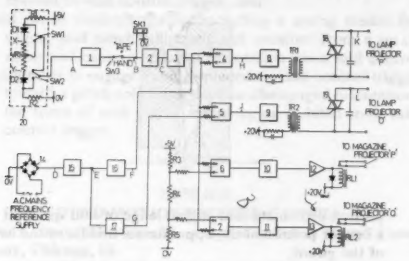
1. In a picture information retrieving system including a counting section for counting pictures on an information recording medium, a memory section for setting therein the sequence number of a desired picture in advance, a comparing section for comparing the output signal of the memory section and the output signal of the counting section, driving means for moving the information recording medium, a driving circuit controlled by the output signal of the comparing section for driving the driving means to move the information recording medium, the improvement comprising only one detection mark provided in correspondence with the first picture on the information recording medium for indicating the initial position of the recording medium, means for detecting the initial position detection mark, means for resetting the counting section in accordance with the detected signal from said initial position mark detecting means during the retrieving operation to correct the content thereof, and means for controlling said driving circuit in response to the detection of the initial position detection mark to stop the driving means.

3,958,875

APPARATUS FOR CONTROLLING SLIDE PROJECTORS

Anthony David Bowry, Clifton, and Christopher Francis, London, both of England, assignors to Animatic Company Limited, London, England

Filed May 31, 1974, Ser. No. 475,293
Claims priority, application United Kingdom, May 31, 1973, 25960/73
Int. Cl.² G03B 21/20, 23/16
U.S. Cl. 353—86 37 Claims



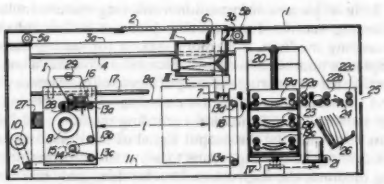
1. A projector control circuit for controlling the illumination of the lamp of the projector, comprising a triggered switch for controlling the supply of an alternating current to the lamp so that the amount of current supplied to the lamp can be varied from zero to the maximum the lamp can draw by varying the a.c. supply phase angle at which the triggered switch is fired, a generator for generating triggering signals for triggering the triggered switch in response to a ramp input signal exceeding the level of a threshold voltage applied to the generator, a ramp generator for producing ramp signals to operate the trigger signal generator, and a frequency signal decoder for producing a frequency dependent, integrated voltage to serve as a threshold voltage for the trigger-signal generator so that, with the triggered switch connected to the projector lamp, by continuously varying the frequency input to the decoder and thereby the threshold voltage applied to the trigger signal generator, the illumination of the lamp can be varied between zero and maximum brightness.

3,958,876

MULTICOLOR REPRODUCING APPARATUS

Isamu Terashima, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 4, 1974, Ser. No. 520,909
Claims priority, application Japan, Nov. 7, 1973, 48-124513
Int. Cl.² G03G 15/01, 15/10
U.S. Cl. 355—4 10 Claims



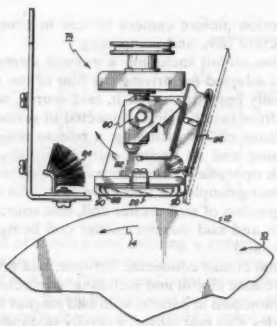
6. A multicolor reprodicing apparatus comprising:
means for exactly positioning a sensitive paper at an exposing position;
means for charging said sensitive paper at said exposing position;
means for exposing said sensitive paper to a predetermined one of a plurality of different colors at said exposing position, said charging means charging said sensitive paper before each exposure to said different colors,
means for developing said sensitive paper for each different color at a developing position after each exposure to said predetermined one of said colors at said exposing position; and
means for transporting said sensitive paper between said exposing position and said developing position, said transporting means repeatedly transporting said sensitive paper from said exposing position to said developing position after each exposure to each one of said colors, and said transporting means repeatedly transporting said sensitive paper from said developing position to said exposing position aft after each development until a predetermined multicolor image is produced on said sensitive paper,
wherein said means for positioning exactly positions said sensitive paper at said exposing position after each transportion by said transporting means of said sensitive paper from said developing position;
wherein said transporting means includes a movable belt member having a horizontally disposed portion extending at least over a distance from said exposing position to said developing position, clamping means for clamping a portion of said sensitive paper, said clamping means being independently movable with respect to said belt member, and drive means for driving at least one of said belt member and said clamping means.

3,958,877

HALF-TONE SCREEN WITH CLEANING MEANS FOR AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

Sukumaran K. Menon, Webster, and Zenon Guran, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 10, 1975, Ser. No. 566,872
Int. Cl.² G03G 15/22
U.S. Cl. 355—4 17 Claims

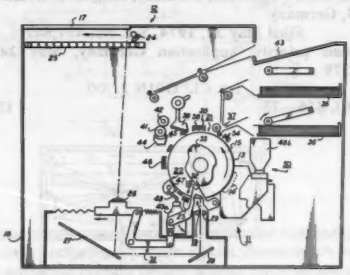


1. An electrophotographic printing machine of the type having a photoconductive member, including:
a screen member mounted moveably in the printing machine;
mean for moving said screen from an inoperative position remote from the photoconductive member to an operative position closely adjacent thereto;
means, responsive to said screen member being in the operative position, for adjusting the spacing between the photoconductive member and said screen member; and
means for cleaning particles from said screen member as said screen member moves from the operative position to the inoperative position.

3,958,878
ELECTROSTATIC PROCESSOR HAVING INTERCHANGABLE RESERVOIRS FOR SUPPLYING AND RECLAIMING TONER

Richard E. Smith, Webster, and Herbert L. Bresnick, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 20, 1974, Ser. No. 525,438
Int. Cl.² G03G *15/00*
U.S. Cl. 355—15 **4 Claims**



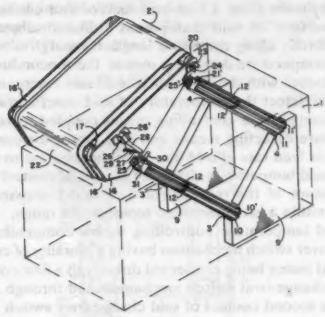
1. An electrostatic processor comprising
a photoconductively coated substrate,
a development system for applying toner to latent electrostatic images carried by said substrate,
a toner dispensing arrangement for resupplying toner to said development system comprising a hopper having an inlet opening and an outlet opening, means for pivotally mounting said hopper for movement between a toner dispensing position and a toner loading position, dispensing control means mounted in said hopper intermediate said inlet and outlet openings for preventing the passage of toner through said hopper when in a first condition and for permitting the passage of toner, on demand, through said hopper when in a second condition, a first container for storing a supply of toner, said first container having a discharge port, and coupling means for attaching said first container to said hopper so that toner may flow from said container into said inlet opening when said hopper is in the toner dispensing position and may flow away from said discharge opening when said hopper is in the toner loading position, whereby said first container may be attached and detached from said hopper without toner spillage, and
a cleaning system for removing residual toner from said substrate, said cleaning system having a second container similar to said first container for collecting said residual toner, said containers being interchangable.

3,958,879
BELT TYPE SENSITIVE MEMBER UNIT

Hiroshi Hamaguchi, Sakai, and Shin Miyata, Toyokawa, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 27, 1975, Ser. No. 553,841
Claims priority, application Japan, Mar. 7, 1974, 49-27093
Int. Cl.² G03G *15/00*
U.S. Cl. 355—16 **8 Claims**

1. In a belt-type photosensitive member unit for use in an electrophotographic reproducing apparatus having a main body portion, the unit including a plurality of rollers rotatably confind between a pair of side frames, an endless belt-type sensitive member being trained about said plurality of rollers for mounting, said rollers comprising a drive roller and a roller provided with a member for adjusting the tension of said endless belt-type sensitive member, the improvement in said unit comprising:
two pairs of rails each rigidly supported at two points on support members provided within the main body of the reproducing apparatus;
two pairs of rails fixed to said sensitive member unit outwardly thereof and adapted to cooperate with said first-mentioned pairs of rails to permit said sensitive member unit to slide therealong;

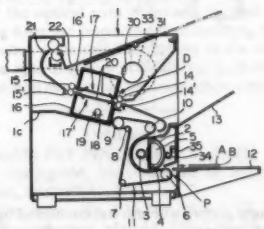


reinforcing rails disposed between said first-mentioned pairs of rails and said second-mentioned pairs of rails in a manner to be slidable to a given position on said first-mentioned pairs of rails, together with said sensitive member unit when same is withdrawn from or returned into the interior of the reproducing apparatus; and
means pivotally mounting said unit to said second-mentioned one of said pairs of rails whereby said unit can be moved away from said second-mentioned rails to provide an opening for access to said endless belt.

3,958,880
COPYING MACHINE OF THE DIAZO TYPE

Takaji Washio, Toyonaka; Tadanobu Nakajima, Kashiwara; Hideo Miyoshi, Habikino; Masahiro Yoshioka, Osaka, and Tatsuo Aizawa, Osaka, all of Japan, assignors to Mita Industrial Company, Ltd., Osaka, Japan

Filed Dec. 5, 1973, Ser. No. 421,924
Claims priority, application Japan, Mar. 12, 1973, 48-28696
Int. Cl.² G03B *27/30*
U.S. Cl. 355—106 **13 Claims**



1. A copying machine of the diazo type, said machine comprising:
a light exposure zone for exposing to light a diazo type photosensitive sheet superposed with an original;
a development zone for developing a light exposed photosensitive sheet;
a delivery mechanism operatively positioned for feeding the original and diazo type photosensitive sheet to said light exposure zone and for forwarding the light exposed photosensitive sheet to said development zone;

a transparent cylinder positioned in said light exposure zone and capable of rotating with a superposed assembly of the original and photosensitive sheet contacting the outer surface thereof;

a heat-generating light source mounted in the interior of said transparent cylinder;

fan means continuously rotated by a continuously operable driving motor for feeding cold air into said transparent cylinder from a first end thereof and cooling the outer surface of said transparent cylinder substantially uniformly along the entire length thereof;

a temperature-detecting means thermoconductively contacted with the outer surface of said transparent cylinder to detect the temperature of said outer surface;

a temperature controlling means coupled to said temperature-detecting means and said motor for controlling the air feed rate of said fan means in response to signals from said temperature-detecting means, to control the temperature of the outer surface of said transparent cylinder within a predetermined temperature range;

said temperature controlling means comprising a change-over switch mechanism having a plurality of contacts; and

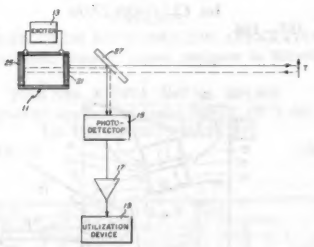
said motor being connected directly to a first contact of said change-over switch mechanism and through a resistor to a second contact of said change-over switch mechanism, said motor rotating said fan at a fixed speed when said first contact is closed and at a lower speed than the fixed speed when said second contact is closed, said switch mechanism being adapted to be changed over and actuated in response to signals from said temperature-detecting means, the rotating speed of said fan means thus being controlled by the change-over of said switch mechanism in response to signals from said temperature-detecting means.

3,958,881

METHOD OF OPERATING A LASER OSCILLATOR AND AMPLIFIER

Wayne H. Keene, Medfield; Christopher R. Miller, South Acton, and Arthur A. Chabot, Westford, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 18, 1970, Ser. No. 90,526
Int. Cl.² G01P *3/36*; H01S *3/00*
U.S. Cl. 356—28 **3 Claims**



1. In a laser system wherein backscattered light energy from objects outside such system is optically mixed with a first portion of the coherent light from the optical resonator of a laser to produce modulated optical signals, each one of such signals being indicative of the Doppler velocity of each object illuminated by a second portion of such coherent light, the method of operating such system comprising the steps of:

a. continuously exciting a laser to produce a first beam of coherent light having a constant power;

b. dividing, in a partially reflective mirror, such first beam into a second and a third beam, the second beam being directed to a photodetector and the third beam being directed outwardly from the laser;

c. passing, through the partially reflective mirror to the optical resonator of the laser, backscattered optical energy from objects illuminated by the third beam;

d. amplifying, in the optical resonator of the laser, only such backscattered optical energy; and,

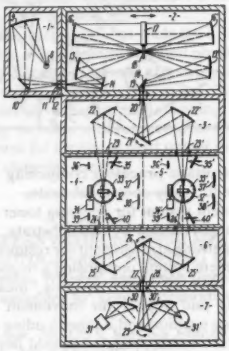
e. optically mixing the amplified backscattered optical energy and the coherent light in the second beam.

3,958,882

SAMPLE CHAMBER FOR AN OPTICAL SPECTROMETER

Jurgen Gast, Forchheim, Germany, assignor to Bruker-Physik AG, Germany

Filed May 22, 1974, Ser. No. 471,847
Claims priority, application Germany, May 24, 1973, 2326379
Int. Cl.² G01N *21/00*
U.S. Cl. 356—73 **13 Claims**



1. A sample chamber for an optical spectrometer comprising:

a. an input port and an output port through which an optical beam may pass;

b. means for holding at least one sample in the chamber;

c. means for selecting one of two modes of operation of the chamber, a transmission mode and a reflection mode, the mode-selecting means comprising:

i. means for directing the optical beam along one of two paths through the chamber corresponding to the mode of operation selected;

ii. means for moving the sample to an orientation relative to the path of the optical beam such that in the transmission mode the optical beam passes into the input port, through the sample, and out of the output port and in the reflection mode the optical beam passes into the input port, impinges upon a surface of the sample, is reflected from said surface, and passes out of the output port; and

iii. means coupling the beam-directing means and the sample-moving means so that changing the mode of operation automatically switches the path of the beam and moves the sample.

3,958,883

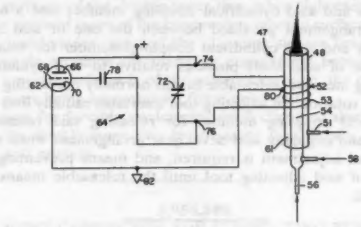
RADIO FREQUENCY INDUCED PLASMA EXCITATION OF OPTICAL EMISSION SPECTROSCOPIC SAMPLES

Arthur S. Turner, Carlisle, Mass., assignor to Baird-Atomic, Inc., Bedford, Mass.

Filed July 10, 1974, Ser. No. 487,168
Int. Cl.² G01J *3/30*
U.S. Cl. 356—85 **12 Claims**

1. A radio frequency excitation apparatus for exciting a spectroscopic sample, said excited spectroscopic sample emitting characteristic radiation, said apparatus comprising:

a. radio frequency power oscillator means having a plate tank circuit and a grid tank circuit defining a single resonant circuit including an induction coil and a tuning capacitor, said induction coil in parallel with said turning capacitor, said plate tank circuit and said grid tank circuit having a common inductance;



b. plasma torch means, said induction coil externally and coaxially encircling a portion of said plasma torch means, said encircled portion of said plasma torch means defining a plasma forming region, said radio frequency power oscillator means exciting a plasma forming gas within said plasma forming region; and

c. means for introducing the spectoroscopic sample into said excited plasma, the spectroscopic sample introduced into said excited plasma emitting characteristic radiation.

3,958,884

INTERFEROMETRIC APPARATUS

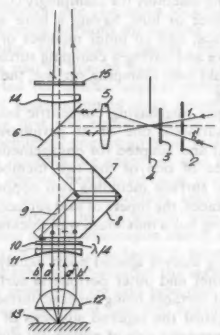
Francis Hughes Smith, York, England, assignor to Vickers Limited, London, England

Filed Apr. 16, 1975, Ser. No. 568,441

Claims priority, application United Kingdom, Apr. 24, 1974, 18017/74

Int. Cl.² G01B 9/02; G02B 21/06

U.S. Cl. 356—106 R **16 Claims**



1. Interferometric apparatus comprising an optical assembly for simultaneously directing two mutually coherent light pencils at different respective angles of incidence towards a point on a surface under investigation and receiving reflected light pencils respectively produced by reflection of the two mutually coherent light pencils at that surface, the optical assembly including optical means for bringing the reflected light pencils at least partially into co-incidence with one another so that the reflected light pencils can interfere optically with one another in a manner which varies with variation in the distance of points on the surface from a reference plane.

3,958,885

OPTICAL SURVEYING APPARATUS, SUCH AS TRANSIT, WITH ARTIFICIAL LIGHT SCALE ILLUMINATING SYSTEM

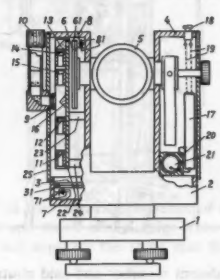
Alfred Stockinger, Germering, and Joachim Mainka, Furstenfeldbruck, both of Germany, assignors to Wild Heerbrugg Aktiengesellschaft, Heerbrugg, Switzerland

Continuation of Ser. No. 393,645, Aug. 31, 1973, abandoned. This application May 12, 1975, Ser. No. 576,655

Claims priority, application Germany, Sept. 5, 1972, 2243509

Int. Cl.² G01C 1/06

U.S. Cl. 356—139 **10 Claims**



1. An optical surveying apparatus such as a transit, or the like, having a housing (4), optical sighting apparatus (5) secured to the housing (4), observation means including read-out positions and scales (3, 6) coupled to the sighting apparatus and located within the housing, a battery (21), scale illumination means connected to the battery to illuminate the scales, and an optical system (9, 10; 11, 12; 13, 14, 15) located in an optical path and comprising reading optics including an ocular to permit observation of the scales at the read-out positions, wherein:

the scale illumination means is entirely included in the housing and comprises

an individual light-emitting semiconductor diode (LED) (7, 8) associated with each of the reading positions, the light-emitting diodes emitting monochromatic light in the visible range, and each located in the housing immediately adjacent the respective scale to individually provide light to the respective scale at the respective individual read-out positions for the orientation of the sighting apparatus;

and wherein the optical path is entirely located within the housing starting from the respective light emitting diode adjacent the respective scale and terminating at the ocular, and the optics of the optical system in the optical path between the respective scale and the ocular are monochromatic.

3,958,886

LOOSELEAF BINDER MECHANISM

Roy H. Price, Springfield, Mo., assignor to Royal Business Machines, Inc., Springfield, Mo.

Continuation of Ser. No. 234,100, March 13, 1972, abandoned. This application May 13, 1974, Ser. No. 469,740

Int. Cl.² B42F 13/12, 13/20

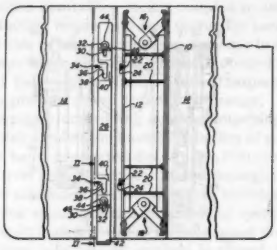
U.S. Cl. 402—75 **12 Claims**

1. In a looseleaf binder including means for holding looseleaf paper, said paper holding means including a member adapted to be latched to a portion of said binder; latching means for so latching said member, said latching means including a latching member shiftable along a given path to and from respective latching and unlatching positions; mounting means for securing said latching member to said binder and mounting said latching member for said shiftable movement; said mounting means including a mounting member secured to said binder and extending in a direction transverse to said

given path; and means for detenting said shiftable latching member in each of its two positions; said detenting means including:

a detent member separate from and movable relative to said latching member and mounted on said mounting member for movement therealong, in said transverse direction, relative to and towards and away from said latching member, said detent member comprising an annulus encircling said mounting member;

abutment stop means engageable by said detent member in the course of the latter's movement away from said latching member;



one of said detent member and said abutment stop means being of elastomeric material;

said latching member being provided with a protuberance protruding in said transverse direction and arranged to engage and move said detent member into engagement with said abutment stop means and hold said detent member in squeezed, press-fitted relationship with, by, and between said protuberance and said abutment stop means, in the course of the shifting movement of said latching member between its latching and unlatching positions.

3,958,887

SHAFT COUPLINGS

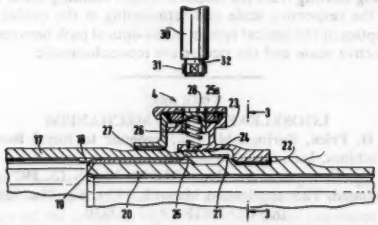
Kenneth Edward George Bracey, Findern, and James Alexander Petrie, Littleover, both of England, assignors to Rolls-Royce (1971) Limited, London, England

Filed Nov. 5, 1974, Ser. No. 521,139

Claims priority, application United Kingdom, Nov. 13, 1973, 52513/73

Int. Cl.² F16D 1/06

U.S. Cl. 403—9 **6 Claims**



1. A shaft coupling assembly adapted to secure together two coaxially extending concentric shaft portions of a gas turbine engine main shaft which are rotationally secured with respect to each other by means of a common set of co-operating splines, the coupling assembly being arranged radially outwardly of the shaft portions and adapted to secure the two shaft portions axially with respect to each other, and which also provides a degree of axial adjustment between the two shaft portions, the improvement including, a cylindrical coupling member having means co-operating with means on each of the shaft portions for normally preventing relative axial movement between the two shaft portions, one of said means being such as to cause relative axial movement of the two shaft portions when one or both of the shaft portions rotate relative to the cylindrical coupling member, said one of said means for causing relative axial movement of the shaft portions including a screw threaded connection between one of said shaft portions and said cylindrical coupling member and a bevel gear arrangement provided between the one of said shaft portions and said cylindrical coupling member for rotating said one of said shaft portions relative to said cylindrical coupling member, releasable means normally preventing said relative rotation, an adjusting tool insertable radially into said cylindrical coupling member for releasing said releasable means and engaging said bevel gear arrangement when relative axial adjustment is required, and means preventing removal of said adjusting tool until the releasable means are engaged.

3,958,888

CLAMPING ASSEMBLY

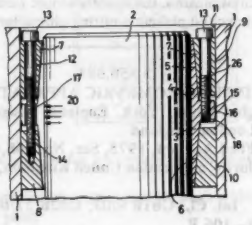
Ralph Mullenberg, Neikenstrasse 6, 4041 Hulchrath, Germany

Filed May 17, 1974, Ser. No. 471,156

Claims priority, application Germany, May 17, 1973, 2324916; July 13, 1973, 2329940

Int. Cl.² F16D 1/06

U.S. Cl. 403—13 **6 Claims**



1. A clamping assembly for clampingly connecting together an outer member or hub, having a bore with a cylindrical clamping surface, and an inner member or shaft receivable within said bore and having a clamping surface concentrically spaced from said bore clamping surface, the clamping assembly comprising:

a double-taper ring having concentric inner and outer peripheral surfaces, one of its peripheral surfaces being cylindrical and adapted for engagement with the clamping surface of one of the two members, the opposite peripheral surface including two oppositely slanting tapered surfaces, the tapers of said surfaces being so slanted that the ring has a maximum wall thickness in its mid-portion;

two clamping sleeves spaced apart axially and having concentric inner and outer peripheral surfaces, one pair of peripheral surfaces being tapered surfaces adapted to be seated against the tapered surfaces of the double-taper ring, the opposite pair of peripheral surfaces being cylindrical and adapted for engagement with the clamping surface of the other one of the two members;

the double-taper ring including in the space between the clamping sleeves an integral centering collar extending to the same diameter as the cylindrical peripheral surfaces of the clamping sleeves when said sleeves are in their clamped state, the double-taper ring thereby serving as a centering means between the hub member and the shaft member, when the assembly is in its unclamped state;

the assembled double-taper ring and clamping sleeves thus defining a package with concentrically spaced inner and outer cylindrical outlines;

a plurality of clamping bolts spaced along the circumference of the assembly and extending axially between the two clamping sleeves within said inner and outer outlines of the assembly, the clamping bolts reaching through one of the clamping sleeves, through a centrally located wall portion of the double-taper ring, and at least a distance into the second clamping sleeve so as to axially advance the sleeves against one another and onto the tapered surfaces of the double-taper ring, when tightened;

the angle of taper of the cooperating tapered surfaces of the double-taper ring and the clamping sleeves being at an angle at which the clamping engagement between said tapered surfaces is of the self-locking type, the clamped parts being separable by force only; and

means for forcibly unclamping each clamping sleeve from the double-taper ring by engaging its centrally located wall portion.

3,958,889

JOINT CONNECTOR FOR CONNECTING TUBES

Irving L. Berkowitz, Binghamton, N.Y., assignor to Kason Hardware Corporation, Binghamton, N.Y.

Filed June 8, 1973, Ser. No. 368,453
Int. Cl.² F16B 7/00
U.S. Cl. 403—172 **8 Claims**

1. A joining device for use in connecting a plurality of tubes, or the like, comprising: a base portion, a plurality of branch portions integral with and extending from said base portion and capable of insertion into said tubes, locking means carried by each of said branch portions for holding said branch portions within a tube, said locking means comprising a body portion having a pair of spaced bearing surfaces and being pivotally supported for limited angular movement between first and second predetermined limit positions, said body portion including first and second rearward surfaces, each adapted to independently engage an inner wall of said branch portion, thereby defining the extent of said limited angular movement, said spaced bearing surfaces projecting from a transverse side of said branch portion, said spaced bearing surfaces being insertable in succession together with said branch portion into a tube whereupon during said insertion a first of said pair of bearing surfaces is substantially freely receivable by the tube and thereafter the second of said pair is only forceably receivable by said tube due to lever action resulting from engagement of said first bearing surface with internal surfaces of the tube.

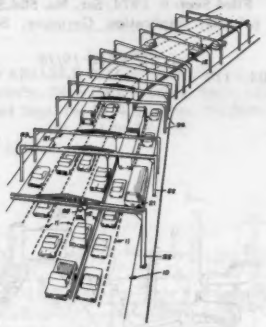
3,958,890

APPARATUS AND METHOD FOR MOVING ROADWAY LANE DIVIDERS

Victor Ferrari, 5486 Ranchito Way, Santa Rosa, Calif. 95401

Filed Aug. 11, 1975, Ser. No. 603,522
Int. Cl.² E01F 9/00
U.S. Cl. 404—9 **12 Claims**

1. A traffic lane delineating apparatus in combination with a roadway having at least one divider disposed thereon to divide and separate first and second groups of lanes, said divider having a plurality of attachment means secured thereon, said apparatus comprising at least one support means mounted vertically above said roadway and transversely across said lanes and hoist means movably mounted on said support means for travel therealong for selectively attaching



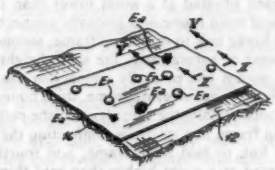
a cable thereof to the attachment means of said divider to selectively raise and move said divider transversely of said lanes to divide and separate the same into third and fourth groups.

3,958,891

AGGREGATE ELEMENTS FOR IMPROVING ANTI-SKID AND VISIBILITY PROPERTIES OF TRAFFIC REGULATING MARKINGS ON ROADWAY PAVEMENTS

Ludwig Eigenmann, Vacallo, Ticino, Switzerland

Filed Mar. 11, 1974, Ser. No. 450,225
Claims priority, application Italy, Mar. 12, 1973, 21473/73; May 30, 1973, 24864/73
Int. Cl.² E01F 9/04
U.S. Cl. 404—16 **25 Claims**



1. As a novel article, an aggregate for securing in a layer of material which is used to form a traffic-regulating indicium, so as to improve the nighttime visibility characteristics and anti-skid characteristics of the traffic-regulating indicium, said aggregate comprising a core body; a mass of a shock-absorbent binder substance at least partially surrounding said core body; and a plurality of elements for improving at least one of said characteristics arranged in and bound by said binder substance such that the latter substantially fills the interspaces between at least the majority of adjacent pairs of said elements, some of said elements being arranged adjacent an external surface of said mass so as to impart a roughened texture to said external surface thereby permitting said aggregate to be firmly secured in the traffic-regulating indicium, and the remainder of said elements being distributed among different levels interiorly of said mass so that progressive wear of said aggregate and concomitant detachement of elements from the latter causes exposure of others of said elements thereby permitting said aggregate to substantially continuously impart improved characteristics to the traffic-regulatiing indicium.

3,958,892

VIBRATORY GROUND ROLLER

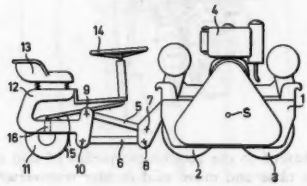
Adolf Bosslet, Halsenbach; Jost Schieche, Baunatal; Hans Scharenberg, Udenhausen; Gulertan Vural, Emmelshausen, and Herbert Roos, Morshausen, all of Germany, assignors to Koehring GmbH, Boppard, Rhine, Germany

Filed Sept. 9, 1974, Ser. No. 504,552

Claims priority, application Germany, Sept. 8, 1973, 2345411

Int. Cl.² E01C 19/38

U.S. Cl. 404—117 5 Claims



1. A vibratory ground roller comprising a main frame, a plurality of rolling drums, bearing means rotatably mounting said rolling drums in said main frame one in front of the other and with the axes thereof parallel, a steering frame, an operator seat on said steering frame, a plurality of links including at least one lower link and at least one upper link forming a pivoted link system connecting said steering frame to said main frame behind said axes of said rolling drums, first connecting means situated at a point lower than the center of gravity of said main frame and pivotally connecting the front end of said lower link to said main frame, second connecting means situated at substantially the same height as said first connecting means and pivotally connecting the back end of said lower link to said steering frame, third connecting means situated at substantially the same level as the center of gravity of said main frame and pivotally connecting the front end of said upper link to said main frame, and fourth connecting means situated at a point higher than said third connecting means and pivotally connecting the back end of said upper link to said steering frame, so that said upper link slopes upwardly from its front end to its back end, said links and said pivotal connecting means being so arranged that when said main frame pitches, the resulting horizontal movements of said pivotal connecting means of said back ends of said links to said steering frame are at least substantially equal to each other.

3,958,893

DRILL GUIDE

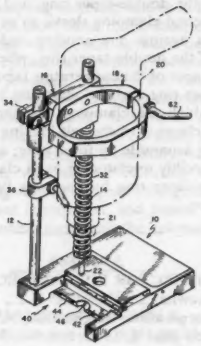
Alfred Z. Boyajian, P.O. Box 811, Manhattan Beach, Calif. 90266

Filed Sept. 10, 1974, Ser. No. 504,807

Int. Cl.² B23B 45/14

U.S. Cl. 408—112 10 Claims

1. A portable power drill guide comprising a base, a carriage, means mounting the carriage on the basis for movement toward and from the base, a coupling, interengageable means on the carriage and coupling supporting the coupling at a predetermined angle and position relative to the base, said coupling containing a seat for receiving the power drill and



providing when the power drill is clamped thereon fore and aft positioning means for the axis of the chuck.

3,958,894

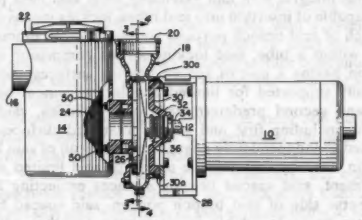
FLUID PUMPING ASSEMBLY OF A MOLDED SYNTHETIC MATERIAL

William N. Rowley, Palos Verdes Estates, and Gordon F. Ehret, Alhambra, both of Calif., assignors to Weil-McLain Co., Inc., El Monte, Calif.

Filed Jan. 22, 1975, Ser. No. 543,060

Int. Cl.² F04D 9/02, 29/40

U.S. Cl. 415—53 R 9 Claims

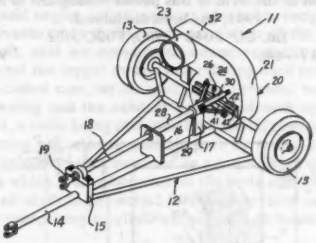


1. A pumping assembly comprising a casing formed of a molded synthetic material and divided substantially symmetrically about a vertical plane extending through the center thereof, said casing comprising a first casing portion having an axially extending volute rib, a second casing portion having an axially extending volute rib abutting said first volute rib in said vertical plane, and means for fastening said casing portions together, said casing portions and said ribs together defining a priming chamber portion and an impeller chamber portion, one of said casing portions defining an inlet opening and said casing portions together defining an outlet opening for permitting the flow of fluid into and from said casing; impeller means disposed in said impeller chamber portion for forcing water into said inlet opening, through said casing, and out said outlet opening; and drive means extending through an opening in said casing and operatively connected to said impeller means.

3,958,895
PUMP WITH SHEARING MEANS

Leonard L. Brisson, 2359 E. Cowern Place, North St. Paul, Minn. 55109

Filed Feb. 7, 1975, Ser. No. 547,935
Int. Cl.² F04D 29/70
U.S. Cl. 415—121 B 8 Claims

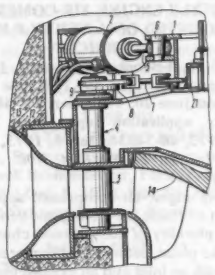


1. A pump comprising support means, a volute housing mounted on said support means and having a tangentially extending outlet duct, said housing having opposed side walls and a central intake opening in at least one of said walls, a rotor including an axial shaft and vanes extending from said shaft, journal means including at least one fixed sleeve secured to said support means and rotatably receiving said shaft, said sleeve extending through said intake opening into said housing, blade means on said vanes extending axially and outwardly into said intake opening, and shear bar means secured externally to the housing and extending radially toward and ending adjacent said sleeve and overlying said intake opening so as to shearingly cooperate with said blade means during rotations of said rotor to cut up trash material entering the housing, said fixed sleeve preventing contact of soft, elongated and pliant pieces of trash with the rotating shaft to avoid tangling thereon and clogging of the pump.

3,958,896
HYDRAULIC MACHINE

Vitaly Viktorovich Vikhirev, Svetlanovsky prospekt, 101, kv. 278; Valentina Vasilievna Loktaeva, prospekt Prosvescheniia, 104, kv. 344; Grigory Abramovich Bronovsky, 7 Sovetskaya ulitsa, 7, kv. 6, and Rady Kirillovich Fasulati, ulitsa Tukhachevskogo, 35, kv. 23, all of Leningrad, U.S.S.R.

Filed Dec. 2, 1974, Ser. No. 528,994
Int. Cl.² F01D 21/06
U.S. Cl. 415—151 2 Claims

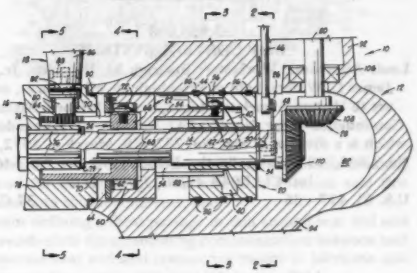


1. Guide apparatus for a hydraulic motor having component parts fixedly embedded in a concrete structure comprising, in combination, a plurality of rotatably mounted vanes, a movably mounted control ring, means for operatively connecting said control ring to said plurality of vanes, at least two actuating motors operatively connected to said control ring for moving said control ring to rotate said plurality of vanes, a plurality of support members, means for mounting said support members on one of the component parts of the hydraulic machine embedded in the concrete structure and means for supporting each of said actuating motors on one of said support members.

3,958,897
VARIABLE PITCH PROPELLER

Daniel M. Connolly, 2418 Ellis, Wichita, Kans. 67216

Filed Sept. 16, 1974, Ser. No. 502,850
Int. Cl.² B63H 3/02
U.S. Cl. 416—166 1 Claim



1. A variable pitch propeller comprising:

a. a housing,

b. a shaft axially mounted in said housing, said shaft including a shaft beveled gear secured on an end and at least one spline member atttached on the circumferential area of the other end,

c. a drive shaft of a rotary power piercing said housing, said drive shaft having a drive shaft beveled gear secured thereto within said housing to mesh with said shaft beveled gear to in use rotate said shaft,

d. a cam rotatably mounted in said housing, said cam including a recess longitudinally extending into the structure of said cam, at least one groove extending radially outward from said recess relative to said shaft, said groove being inclined relative to a plane passing perpendicularly through said shaft,

e. a linkage means positioned within said housing to partially turn said cam, said linkage means comprising a connecting rod pivotally mounted with said cam, a push rod piercing said housing and pivotally connected to said connecting rod,

f. a roller drum slidably mounted in said housing contiguously positioned with respect to said cam, said roller drum having a cam follower extending from said drum and longitudinally movable within said recess, roller means attached to said cam follower and slidably housed within said groove of said cam, said roller drum including a structure defining an open portion on the side opposite to said cam followers, said open portion having an open portion groove situated within and generally extending radially outward relative to said shaft,

g. a rotatable member slidably mounted on said shaft, said rotatable member comprising a collar which is slidably mounted with said shaft by a splined connection means having said splines on said shaft, at least one elongated member extending from said collar, said collar including a roller drum follower attached thereto for engaging said open portion groove,

h. a hub rigidly mounted on said shaft and having a substantially blunt rear face, said hub including a splined mounting means in its center portion to engage said splines on the end portion of said shaft, said hub having a hollow

interior portion to receive said elongated members of said rotatable member, a seal means situated on the inner portion of said hub such that its junction with said housing provides a sealing mechanism to prevent seepage of water,

i. a propeller blade pivotally mounted on said hub, said propeller blade having a stem portion pivotable in said hub, and

j. said elongated members of said rotatable member including a rack type gearing means on its end portion, said stem portion of said propeller blade being supported in a bearing and stem retaining assembly means in the outer portions of said hub, said stem portion including a gear means on its inner end portion to engage with said rack gearing means of said elongated members.

3,958,898

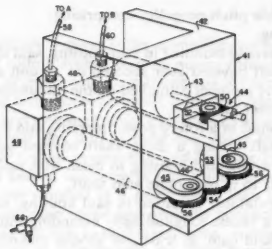
PUMP CONTROL SYSTEMS

Louis Abrahams, Worcester; Burleigh M. Hutchins, Jr., and James L. Waters, both of Framingham, all of Mass., assignors to Waters Associates, Incorporated, Milford, Mass.

Continuation of Ser. No. 417,147, Nov. 19, 1973, abandoned, which is a division of Ser. No. 232,128, March 6, 1972, Pat. No. 3,855,129. This application Feb. 3, 1975, Ser. No. 546,727

Int. Cl.² F04B *49/00, 35/04, 21/02*

U.S. Cl. 417—36 **37 Claims**



1. In a liquid delivery system of the type comprising a pump and outlet useful for supplying from said outlet a liquid under pressure the improvement wherein there is interposed between said pump and a discharge port from said delivery means 1) a pressure-sensing means and 2) flow-control means operably communicating between said pressure-sensing means and a motor drive means for said pump, said control means operably interacting with said drive means to control the flow-output of said pump by controlling the speed of said motor;

wherein said flow-control means comprises A) Bourdon-type tube, the interior of which forms a flow path for substantially all said liquid B) means for sensing displacement of said tube in response to pressure of the liquid therein, and C) motor control means comprising said sensing means and a motor drive means for said pump;

wherein said Bourdon-type tube is enclosed within a housing and mounted between a light source and a light-sensing said light source and sensing means forming said displacement-sensing means, and also forming means to provide an input signal to said motor control means; and

wherein said Bourdon tube is bent to form two substantially parallel segments of a single conduit.

3,958,899

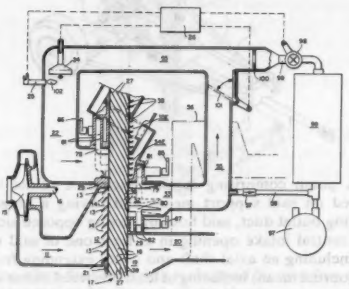
STAGED EXPANSION SYSTEM AS EMPLOYED WITH AN INTEGRAL TURBO-COMPRESSOR WAVE ENGINE

Richard R. Coleman, Jr., Malvern, and Helmut E. Weber, Valley Forge, Pa., assignors to General Power Corporation, Paoli, Pa.

Division of Ser. No. 191,410, Oct. 21, 1971, Pat. No. 3,811,796. This application Apr. 25, 1974, Ser. No. 464,101 The portion of the term of this patent subsequent to May 21, 1991, has been disclaimed.

Int. Cl.² F04B *11/00;* **F02C** *3/02*

U.S. Cl. 417—64 **9 Claims**



1. A method for effecting a multi-staged expansion and reentry of high pressure gases from and into the chambers of a moving rotor comprising the steps of:

a. expanding some of said gases from the chambers of said moving rotor thereby effecting once expanded gases;

b. reducing, simultaneously with step (a), the pressure of said gases remaining in said chambers of said rotor thereby effecting once reduced pressure gases in said chambers;

c. expanding some of said once reduced pressure gases, in said chambers, from said chambers thereby effecting gases which have been subjected to two pressure reductions.

d. reducing, simultaneously with step (c), the pressure of said once reduced gases remaining in said chambers of said rotor thereby effecting twice reduced pressure gases in said chambers;

e. reentering said once expanded gases into the chambers of said moving rotor upon the completion of step (d).

3,958,900

CONVERTIBLE ENGINE-AIR COMPRESSOR APPARATUS MOUNTED ON A VEHICLE FOR DRIVING SAID VEHICLE

Takahiro Ueno, 5-11, 4-Bancho, Wakayama, Japan

Continuation-in-part of Ser. No. 369,119, June 11, 1973. This application June 20, 1974, Ser. No. 481,183

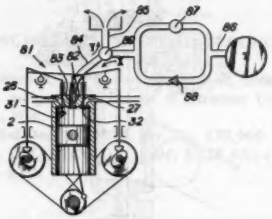
Claims priority, application Japan, June 22, 1973, 48-70559; July 2, 1973, 48-74536; July 5, 1973, 48-76269

Int. Cl.² F04B *41/04, 7/00*

U.S. Cl. 417—237 **2 Claims**

1. A convertible engine-air compressor apparatus adapted to be mounted on a vehicle for driving said vehicle comprising a body having a plurality of compression chambers in which explosion can take place, each of said compression chambers being provided with an inlet and an exhaust openings, an inlet valve and an exhaust valve mounted in the body for each compression chamber for opening and closing the inlet and exhaust openings, a piston reciprocably mounted within each compression chamber, crank shaft means rotatably mounted in the body and connected to the pistons for reciprocating the pistons, two cam shafts rotatably mounted on the body and

connected to the crank shaft to be rotated thereby, a pair of cams for each inlet valve and each exhaust valve for each compression chamber mounted on a first cam shaft, each cam of each pair comprising a cylindrical segment, an engine action segment and an air compressor action segment, each of said segments adapted to engage tappet means, said tappet means reciprocably mounted on the body for each inlet and each exhaust valve for opening and closing the valves, said cylindrical segment adapted not to reciprocate the tappet means, said engine action segment adapted to reciprocate the tappet means once during each revolution of the associated cam shaft, said air compressor action segment adapted to reciprocate the tappet means twice during each revolution of the associated cam, an air port being provided between the inlet opening and the exhaust opening of each compression chamber, a valve being provided for each air port, a third cam for opening and closing said air port by means of a tappet means for said air port mounted on a second cam shaft for the air ports which is also mounted on the body and connected to said crank shaft to be rotated thereby, the third cam for said air port comprising a cylindrical segment, a rotation starting



segment and a residual air exhaust segment, each segment of the third cam adapted to engage the tappet means for said air port, the tappet means for said air port reciprocably mounted on the body for opening and closing the air port valve and the cylindrical segment of said third cam adapted not to reciprocate the tappet means for said air port, said rotation starting segment adapted to reciprocate the tappet means for said air port once during each revolution of the second associated cam shaft, said residual air exhaust segment adapted to reciprocate the tappet means for said air port twice during each revolution of the second cam shaft, the first and the second cam shafts axially adjustable and mounted on the body so that the rotation starting segment of the third cam for said air port may engage the tappet means for the air port when the tappet means being in contact with the engine action segment of each cam of each pair, the cylindrical segment of the third cam for said air port may engage the tappet means for said air port, when the tappet means being in contact with the engine segment of each cam of each pair, the residual air exhaust segment of the third cam for said air port may engage the tappet means for said air port when the tappet means being in contact with the compressor action segment of each cam of each pair.

3,958,901

AXIAL PISTON PUMP

Michel Drevet, Sevres, France, assignor to Compagnie des Services Dowell Schlumberger, Paris, France

Filed Oct. 5, 1973, Ser. No. 404,021

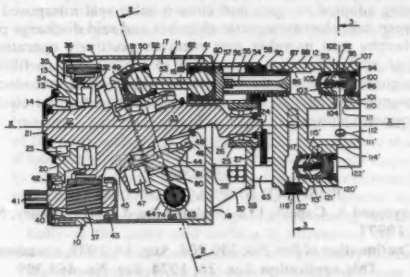
Claims priority, application France, Oct. 20, 1972, 72.37204

Int. Cl.[2] F04B 1/12

U.S. Cl. 417—269 **2 Claims**

1. In a high power pump of the type having a frame, a plate mounted on the frame for rotation about an axis, a drive shaft for driving the plate, the plate having a surface inclined with respect to the axis, a swash-plate bearing on the inclined surface of the rotating plate, a transverse blocking rod mounted between first and second seats attached to the frame and the swash-plate, respectively, to prevent rotation of the swash-plate relative to the frame, a cylinder block fixed to the frame in which pistons can slide parallel to said axis, and connecting means between said pistons and said swash-plate, the improvement comprising

means defining a first passage in said first seat and a fixed inlet to said passage for receiving lubricating fluid under pressure;



means defining a second passage in said transverse blocking rod for establishing communication between said first seat and said second seat; and

means defining a third passage in said second seat and said swash-plate for establishing communication between said second seat and said connecting means to lubricate said connecting means with said lubricating fluid.

3,958,902

ELECTROMAGNETIC PUMP

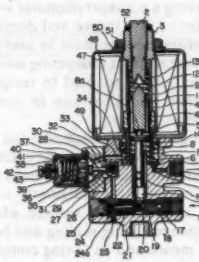
Akira Toyoda, and Shizuo Arima, both of Tokyo, Japan, assignors to Taisan Industrial Co., Ltd., Tokyo, Japan

Filed May 22, 1975, Ser. No. 579,866

Claims priority, application Japan, June 14, 1974, 49-67027

Int. Cl.[2] F04B 39/08

U.S. Cl. 417—279 **10 Claims**



1. An electromagnetic pump comprising an electromagnetic coil, magnetic paths arranged in said electromagnetic coil and constituting a yoke, an electromagnetic plunger arranged in a plunger case mounted in said magnetic paths in said magnetic coil for reciprocating movement along the longitudinal axis of said plunger case by the electromagnetic force and the biasing force of a return spring, a main body connected to said electromagnetic coil, said main body comprising a suction port and a discharge port for a fluid, suction and discharge valve means for drawing the fluid by suction through said suction port and discharging the same through said discharge port as said electromagnetic plunger moves in reciprocatory movement, and an electromagnetic valve chamber maintained in communication with said discharge valve means and operatively associated with the electromagnetic plunger, at least one of said magnetic paths having its cross-sectional area

reduced at one end thereof which is associated with said electromagnetic valve chamber and disposed on the longitudinal axis of the electromagnetic coil so as to define a magnetic gap between outer periphery of the electromagnetic plunger and the reduced cross-sectional area portion of said magnetic path, and a movable iron member of the cylindrical shape arranged in said magnetic path to facilitate concentration and passing of lines of magnetic force necessary for the operation of the electromagnetic pump, said movable iron member being adapted to open and close a valve seat interposed between said electromagnetic chamber and said discharge port, whereby said movable iron member positively operates to open said valve seat as a result of the attempt to fill said magnetic gap as an electric current is passed to said electromagnetic plunger so as to increase the output of the electromagnetic plunger.

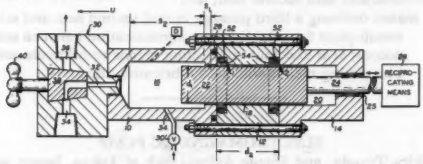
3,958,903
POSITIVE DISPLACEMENT DEVICE

Raymond A. Capelli, 112-1P Union Road, Spring Valley, N.Y. 10977

Continuation of Ser. No. 280,704, Aug. 14, 1972, abandoned. This application Apr. 26, 1974, Ser. No. 464,399

Int. Cl.² F04B *39/02*; **F15B** *11/18*

U.S. Cl. 417—503 **6 Claims**



1. Positive displacement device comprising

a. housing means defining a fluid intake and discharge chamber;

b. seal housing means adjacent said housing means;

c. piston means having a constant diameter which is smaller than the diameter of said intake and discharge chamber such that said piston reciprocates in said chamber with complete clearance without contacting said chamber and said piston being further adapted to reciprocate in said seal housing means with clearance in contact with seal and guide as defined below;

d. combined bearing and seal means adapted to prevent the flow of fluid from said fluid intake and discharge chamber to said seal housing means, said seal means being adjacent said chamber and having a polymeric channel-shaped ring presenting a flat annular surface which surrounds said piston in positive sliding sealing and bearing contact with said piston means and an O-ring compressively positioned between the channel ring and the seal housing means to urge the channel ring against the piston means at a right angle to its direction of travel;

e. guide means positioned in the seal housing means and spaced rearward of said combined bearing and seal means, said guide means having a polymeric channel shaped ring presenting a flat annular surface surrounding said piston in positive sliding contact therewith and an O-ring compressively positioned between the channel ring and the seal housing means to urge the channel ring against the piston means at a right angle to its direction of travel, said seal means and said guide means being spaced apart a distance equal to or greater than the diameter of the piston means;

f. means to reciprocate said piston means in said fluid intake and discharge chamber and said seal housing means, said piston annularly contacting solely said spaced apart seal and guide means in said seal housing means; and

g. valve means in communication with said fluid intake and discharge chamber adapted to allow fluid to flow into and/or from said chamber in response to the movement of said piston means therein.

3,958,904
BALL-AND-SOCKET JOINT

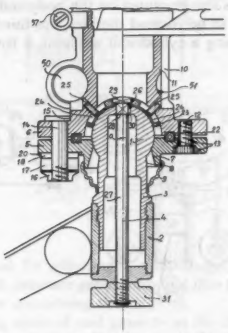
Maurice Rusbach, Vernier, Switzerland, assignor to Sarmac S.A., Carouge, Switzerland

Filed Mar. 25, 1975, Ser. No. 562,040

Claims priority, application Switzerland, Apr. 5, 1974, 4819/74

Int. Cl.² F16C *11/10*

U.S. Cl. 403—90 **15 Claims**



1. A ball-and-socket joint comprising an upper jaw and a lower jaw, one arranged on one side of a median plane of a ball, and the other disposed on the other side of said plane, and a means for clamping these jaws to lock the joint in a required position, characterized in that it comprises: a part-spherical cup disposed between the upper jaw and the ball; a first guide means limiting displacement of this cup relatively to the upper jaw in a first central plane of symmetry of the ball; and a second guide means limiting displacement of this cup relatively to the ball in a second central plane of symmetry of the ball, and in that this first and second plane of symmetry are at right-angles to each other.

3,958,905
CENTRIFUGAL COMPRESSOR WITH INDEXED INDUCER SECTION AND PADS FOR DAMPING VIBRATIONS THEREIN

Homer J. Wood, Sherman Oaks, Calif., assignor to Deere & Company, Moline, Ill.

Filed Jan. 27, 1975, Ser. No. 544,520

Int. Cl.² B64C *11/16*

U.S. Cl. 416—183 **12 Claims**

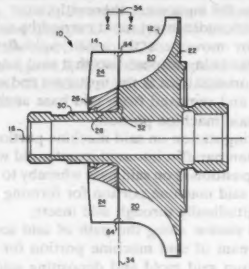
1. A centrifugal compressor for a gas turbine engine comprising:

an impeller including a plurality of impeller blades, each of said blades having an inlet edge and a low pressure face;

a plurality of damper pads each projecting from the low pressure face of an impeller blade adjacent the inlet edge; and

an inducer coupled to the impeller for rotation therewith and including a plurality of inducer blades each being indexed relative to a corresponding impeller blade and each having an outlet edge and a high pressure face, a

portion of the high pressure face of each inducer blade adjacent the outlet edge of the inducer blade engaging the



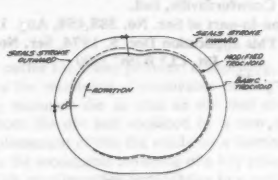
damper pad on a corresponding impeller blade without being secured thereto.

3,958,906

ROTARY ENGINE WITH MODIFIED TROCHOIDALLY SHAPED INNER WALL

Robert K. Catterson, and Robert K. Mitchell, both of Brookfield, Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Dec. 23, 1974, Ser. No. 535,966
Int. Cl.² F01C *1/02, 19/04;* **F02B** *55/14*
U.S. Cl. 418—61 A **3 Claims**



1. In a machine of the character described, wherein a rotor having circumferentially spaced apexes is journalled on an eccentric portion of a rotor shaft rotatably mounted in a housing that has an inner peripheral wall surface of basically trochoidal shape with a plurality of lobes, radiating from a common center, said lobes being one less in number than the number of rotor apexes, and each lobe being symmetrical about a center line radiating from said common center and being separated by a cusp from its next adjacent lobe in the direction of rotor rotation, the apexes of the rotor coacting with said inner peripheral wall to define a plurality of discrete working chambers that vary in volume as rotation of the rotor about the shaft orbitally moves the apex seals along said inner peripheral wall surface, said discrete chambers being sealed from one another by means including apex seals that occupy transverse slots in the apexes of the rotor so that pressure differentials in the chambers flanking the apex seals and manifested in the slots force the apex seals against said inner peripheral wall surface of the housing and also against a side of the slots they occupy, the pressure differential at opposite sides of each apex seal varying as the seal traverses the inner peripheral wall surface of each lobe, increasing significantly as the seal moves through the lobe, customarily identified as the compression lobe when the machine is a rotary engine, to reach maximum at a location approximately two-thirds the circumferential distance from a point at which the centerline of that lobe intersects said surface to the cusp dividing that lobe from its next adjacent lobe, then diminishing from said location as the apex seal crosses the cusp and again increasing and diminishing as the seal traverses the next adjacent lobe, the improvement by which

scoring of said inner peripheral wall surface of the housing by the forced engagement therewith of the apex seals is significantly minimized,

and which improvement resides in:

means to effect outward stroking of each apex seal in the slot it occupies as the seal traverses said identified lobe, the magnitude of said outward stroking reaching its maximum at a point beyond the location at which the differential in pressure at opposite sides of the seal is greatest,

the means for effecting said outward stroking of the apex seals residing in an outward displacement of the inner peripheral wall surface of said identified lobe from an imaginary path that would be traced by the sealing edges of the apex seals upon rotation of the rotor and the shaft if said seals remained in identical positions with respect to the rotor axis and neither stroked inward nor outward,

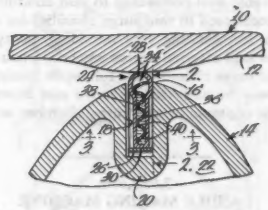
said outward displacement of the inner peripheral wall surface from said imaginary path commencing substantially at the point said surface is intersected by the centerline of said identified lobe and gradually increasing in magnitude from said point to reach maximum at a point beyond the location on the orbit of the apex seals at which the pressure differential at opposite sides thereof is greatest, and from said point of maximum outward displacement gradually decreasing in magnitude but continuing across said cusp into the next adjacent lobe, and then merging gently with the aforesaid imaginary path.

3,958,907

ISOTHERMAL APEX SEAL FOR ROTARY ENGINES

Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 20, 1975, Ser. No. 542,533
Int. Cl.² F01C *19/02, 21/06;* **F16J** *15/00*
U.S. Cl. 418—91 **5 Claims**



1. In a rotary engine, the combination comprising:

a housing;

a rotor having at least two apices and within said housing;

a plurality of grooves in said rotor corresponding to the number of apices and each located at a respective one of said apices;

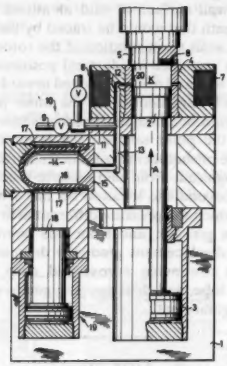
a plurality of apex seals, one disposed in each of said grooves and extending partially out of the corresponding groove to engage said housing, each of said seals having an internal, closed cavity; and

a body of vaporizable material within and only partially filling the cavity of each of said seals, said material having the characteristic of undergoing phase changes to the vapor phase when subjected to relatively high temperatures due to heat generated by friction and combustion gasses and from the vapor phase when subjected to the relatively lower temperature of said rotor.

3,958,908
DEVICE FOR THE PRODUCTION OF CERAMIC MOULDINGS, AND MORE ESPECIALLY OF MAGNETIZED FERRITE MOULDINGS

Rolf Schubart, Kochel am See, Germany, assignor to Dorst-Keramikmaschinen-Bau Inh. Otto Dorst u. Dipl.-Ing. Walter Schlegel, Kochel am See, Germany

Filed May 23, 1974, Ser. No. 472,680
Claims priority, application Germany, June 7, 1973, 2329219
Int. Cl.² B28B *3/02*; B29C *3/00*
U.S. Cl. 425—84 **5 Claims**

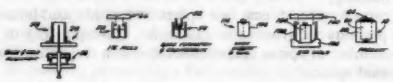


1. An apparatus for forming ceramic moulding from a suspension of mouldable solids in liquid, said apparatus has a die with a liquid permeable wall and a movable punch forming a moulding cavity and means including a conduit and an external source for supplying the suspension to said cavity, the improvement in said apparatus comprising: a surge chamber having a movable wall connected to said conduit and means operatively connected to said surge chamber for moving said wall, a valve for isolating said moulding cavity and surge chamber from said external source whereby when said moulding cavity and surge chamber are full, upon closing said valve said means may be activated to move said movable wall to pressurize the contents of said surge chamber and moulding cavity.

3,958,909
CANDLE MAKING MACHINE

Nereo A. Estrugo, 105 Medford St., Arlington, Mass. 02174

Filed Apr. 7, 1975, Ser. No. 565,804
Int. Cl.² B29D *31/00*
U.S. Cl. 425—112 **8 Claims**



1. A machine for producing decorative candles of the type having a main body portion and insert, said machine comprising:

an upstream end;

a downstream end from which the final candle may be removed;

a first conveyor;

a second conveyor;

a portion of said machine at said upstream end wherein a horizontal section of said second conveyor extends parallel to and spaced vertically above a horizontal section of said first conveyor;

at least one candle insert mold base carried by said first conveyor for movement therewith;

at least one candle insert mold carried by said second conveyor for movement therewith, said first and second conveyors being disposed so that said insert mold is deposited on said base at the upstream end of said machine portion and removed from said base at the downstream end of said machine portion;

a first casting station on said machine portion for introducing molten paraffin into said insert mold when said insert mold is positioned on said base whereby to cast an insert;

means on said machine portion for forming a bore extending longitudinally through said insert;

a removal station along the path of said second conveyor downstream of said machine portion for removing said insert from said mold and depositing said insert onto a third conveyor;

a third conveyor downstream of said second conveyor and adapted to receive inserts from said second conveyor;

means along said third conveyor for passing a wick through said insert bore;

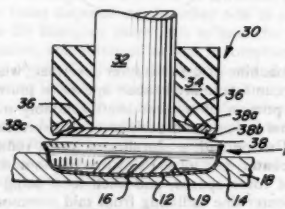
means along said third conveyor for depositing a main body mold about said insert; and,

a second casting station along said third conveyor for introducing molten paraffin about said main body mold.

3,958,910
APPARATUS FOR FORMING CLOSURE INSERTS

Sheldon L. Wilde, Crawfordsville, Ind., assignor to H-C Industries, Inc., Crawfordsville, Ind.

Continuation-in-part of Ser. No. 388,458, Aug. 15, 1973, abandoned. This application Dec. 5, 1974, Ser. No. 529,823
Int. Cl.² B29C *3/00*
U.S. Cl. 425—127 **26 Claims**



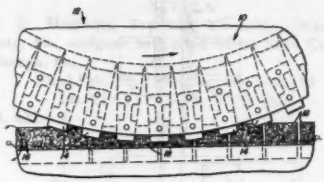
1. Apparatus for forming thermoplastic material disposed in a closure shell into a sealing insert, said shell having a bottom portion and a sidewall, comprising: plunger means having a lower portion; an elastomeric material engaging said lower portion of said plunger means, said elastomeric material having a lower surface bounded by a peripheral edge, said lower surface defining a working surface; sealing means operatively positioned in engagement with said elastomeric material and located at the peripheral edge of the lower surface of said elastomeric material, said sealing means having an outer diameter generally equal to the diameter of said shell bottom portion whereby when the plunger means is moved downwardly into a shell disposed therebeneath, said sealing means forms an outer boundary of said insert and said plunger means flexes said elastomeric material inward of said sealing means to form said insert.

3,958,911

DIE CUTTER FOR FORAGE CUBING DEVICE

Patricia L. Makeham, Crazy Horse Ranchos Lot No. 2, Weatherford, Tex. 76086; Donnie M. Smith, 6 Martin, P.O. Box 5626 - Riac, and Joseph D. Beaty, 1201 W. McGaffey No. 25, both of Roswell, N. Mex. 88201

Filed Apr. 12, 1974, Ser. No. 460,487
Int. Cl.² B26D 7/00; B29C 17/14
U.S. Cl. 425—289 4 Claims



1. A die cutter for a hay pelleter, comprising, in combination: means for mounting a removable cutting sleeve on a replaceably mounted die so that an old dull sleeve may be removed from the die and replaced by a new, sharp sleeve without replacement of the die easily by a farmer in the field including; a die mountable on a ring of a hay pelleter; a sleeve provided with merging walls terminating in a cutting edge and removably mounted on the die, the die including a substantially wedge-shaped portion and a pair of members arranged embracing the wedge-shaped portion, the wedge-shaped portion being arranged forming a seat for receiving the sleeve, the sleeve is substantially V-shaped and the merging walls are a pair of planar walls arranged converging toward one another to form the V, the converging walls forming the cutting edge at the juncture thereof, and the sleeve further includes a pair of spaced, parallel plates arranged abutting the planar walls in perpendicular, embracing relationship with respect to the walls, each of the plates being provided with a V-shaped notch arranged for matching with the V formed by the planar walls.

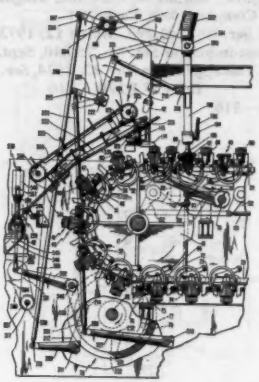
3,958,912

APPARATUS FOR AND METHOD OF MAKING PASTRY CUPS AND THE LIKE

Arthur J. Griner, Wyckoff, and Daniel Anthony Koppa, Bloomfield, both of N.J., assignors to Nabisco, Inc., East Hanover, N.J.

Filed Jan. 4, 1971, Ser. No. 103,707
Int. Cl.² A21B 5/02
U.S. Cl. 425—348 S 21 Claims

1. Apparatus comprising a conveyor carrying a plurality of longitudinally spaced molds and interfitted cores, a plurality of core storage means on the conveyor, said storage means alternating with the molds longitudinally of the conveyor, a first core manipulating means for removing the cores from the molds and temporarily storing the removed cores on said storage means, and a second core manipulating means downstream of the first core manipulating means for removing the



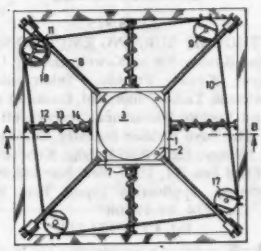
cores from said storage means and reinserting them in the molds.

3,958,913

COOLING DEVICE FOR TUBULAR SHEETING

Georg Stangl, Ehring, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 26, 1974, Ser. No. 527,445
Claims priority, application Germany, Dec. 1, 1973, 2359975
Int. Cl.² B29C 25/00
U.S. Cl. 425—445 4 Claims

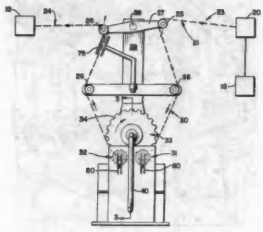


1. A cooling device for tubular sheeting comprising adjustable cooling elements having a cooling agent and forming a cooling zone surrounding the tubular sheeting wherein plane cooling elements and segmental cooling elements alternate to form a closed hollow space as cooling zone; the plane cooling elements being in the form of plates having a universally plane and regular trapezoidal shape, the segmental cooling elements being in the form of plates tapering off in the running direction of the tubular sheeting and having a curved inner surface as well as an outer surface formed by two equal plane faces extending to the outer edges of the plate and meeting at a right angle or an angle greater than 90°C; the plane cooling elements being located on the adjacent segmental cooling elements and both said cooling elements being arranged in a manner adjustable transversely as well as in inclined direction with respect to the axis of the hollow space so that the hollow space is the shape either of a cylinder or of a truncated cone.

3,958,914
APPARATUS FOR PROTECTIVELY COVERING CONTAINER NECKS

Dusan S. Lajovic, Smithfield, Australia, assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 340,293, March 12, 1973, which is a continuation-in-part of Ser. No. 75,840, Sept. 28, 1970, abandoned. This application Nov. 12, 1974, Ser. No. 523,067
Int. Cl.² B29D 17/16
U.S. Cl. 425—510 9 Claims

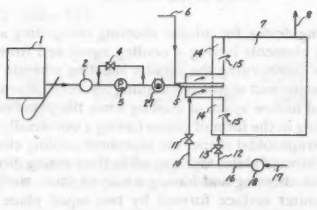


1. In apparatus for applying a covering element of heat shrinkable synthetic plastics material upon the neck of a dispensing container, means for positioning a container at an element applying station, means for providing a continuous length supply of tubing of said material in flattened tape-like form, means for longitudinally advancing said tubing toward the neck of a container positioned at said station, tubing spreading means in the path of the leading end of said tubing comprising a floating mandrel adapted to be peripherally enclosed within the moving expanding and expanded tubing, means at said station for severing a length of expanded tubing at said open end to provide a tubular element of desired length separated from said continuous length tubing and for positioning said element in surrounding relation to said neck in position for heat shrinking said element onto said neck.

3,958,915
METHOD OF BURNING EMULSION OILS

Hideyo Noda, Kyoto; Norio Kawai, Osaka; Osamu Tarue, Nagaokakyo; Kazuo Fukada, Takarazuka; Sigeyoshi Idehara, Akashi; Tadao Nakanishi, Osaka; Yuzo Kakimoto, Akashi, and Yoshito Nakamura, Ibaraki, all of Japan, assignors to The Toyo Rubber Industry Co., Ltd., Osaka and Kawasaki Jukogyo Kabushiki Kaisha, Kobe, both of, Japan

Filed Feb. 11, 1975, Ser. No. 548,994
Claims priority, application Japan, Feb. 15, 1974, 49-19007; Feb. 15, 1974, 49-19008
Int. Cl.² F23J 5/02
U.S. Cl. 431—9 16 Claims

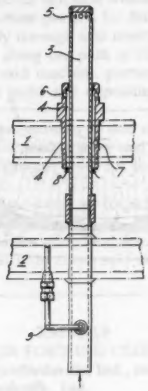


1. In burning an emulsion oil containing oil and water in a ratio of 5 – 9.5 : 5 – 0.5 by volume, a method characterized in that the emulsion oil is burned with 30 to 105 vol. % of primary air and 15 to 200 vol. % of secondary air based on the theoretically required amount of air, the amount of total combustion air being 100 to 300 vol. % based on the theoretically required amount of air.

3,958,916
DISTRIBUTOR PLATE

Michael Harris Barker, Ockley, and Alan Gregson Roberts, Dorking, both of England, assignors to The British Coal Utilization Research Association Limited, Leatherhead, England

Filed Jan. 8, 1975, Ser. No. 539,592
Claims priority, application United Kingdom, Jan. 10, 1974, 1149/74
Int. Cl.² F23D 19/00
U.S. Cl. 431—170 8 Claims

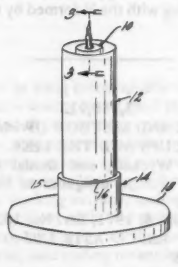


1. A distributor plate comprising a chamber having a fuel inlet and an air tube passing through the chamber, the interior of the air tube being in communication with the chamber, one end of the air tube terminating in a head having outlets adapted to supply a combustible mixture including fuel and air to a fluidised bed furnace, there being a surrounding tube around the air tube, which surrounding tube has an air inlet and air outlet, the air outlet being adapted to supply air to a region of the fluidised bed beneath the head supplying the combustible mixture to the fluidised bed.

3,958,917
SCENTED RING FOR CANDLES

John F. Naz, 6523 Wellesley Terrace, Waterford, Mich. 48095

Filed Sept. 10, 1973, Ser. No. 395,907
Int. Cl.² C11C 5/00
U.S. Cl. 431—289 1 Claim



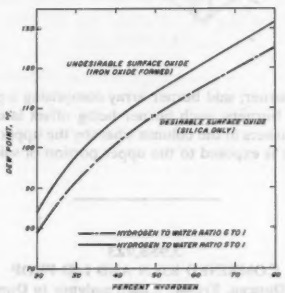
1. A combination consisting solely of a candle having a one-piece monolythic cylindrical body of a combustible material and having a central axially upwardly projecting wick, and an odorizer element overlying the upper end of said candle, said odorizer element being annular in shape and formed from

a material that is combustible and consumable entirely independent of said candle, whereby said element may be removed and replaced without in any way affecting the normal operation, size or volume of the combustible material of the candle body, said element being smaller in outer diameter than said candle body and including a central passage of a larger cross-sectional size than said wick and having said wick extend in relative spaced relationship upwardly therethrough when the element rests directly upon said upper end of said candle body; said element being impregnated with an odoriferous substance for providing a selective fragrance in response to combustion of said element.

3,958,918
METHOD FOR ELIMINATION OF FURNACE ROLL PICKUP MARKS ON SILICON CONTAINING SHEET STEEL

Arthur R. Henricks, Franklin Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 10, 1975, Ser. No. 548,715
Int. Cl.² F27B *9/04*; F27D *7/00*
U.S. Cl. 432—2 **7 Claims**


UNDESIRABLE SURFACE OXIDE (IRON OXIDE FORMED)
DESIRABLE SURFACE OXIDE (SILICA ONLY)
DEW POINT, °F.
HYDROGEN TO WATER RATIO 6 TO 1
HYDROGEN TO WATER RATIO 8 TO 1
PERCENT HYDROGEN

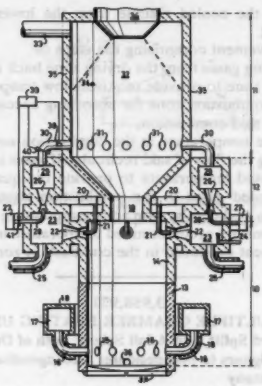
1. A process for continuous annealing a silicon containing sheet steel whereby furnace roll pickup is substantially eliminated, the process comprising continuously annealing said steel at a temperature of from 1,400° to 1,650°F in a furnace provided with furnace rolls having a silica peripheral surface, and maintaining in the furnace a decarburizing atmosphere containing hydrogen and water at a ratio sufficient to cause the formation of only silica on the steel surface.

3,958,919
METHOD AT MELTING IN A SHAFT FURNACE

Sven Olof Kjell Kjell-Berger, Skovde, Sweden, assignor to Rockwool Aktiebolaget, Sweden

Filed June 10, 1974, Ser. No. 478,098
Claims priority, application Sweden, June 18, 1973, 7308571
Int. Cl.² F27B *15/00*
U.S. Cl. 432—14 **11 Claims**

1. In a method for melting a material in a vertical shaft furnace having an upper portion, a lower combustion zone portion and an intermediate post-burning portion, said upper and lower portions being separated by a restriction and wherein coke is burned and the material melted in said lower combustion zone by introducing a blast of air close to the bottom of the lower combustion zone to produce combustion gases containing CO and/or H_2S, the improvement which comprises providing a slurry covered coke to said lower combustion zone for combustion and directing the combustion gases resulting from the combustion of said slurry covered coke to said intermediate post-burning portion and post-burning said combustion gases by introducing into said combustion gases a second blast of air at a level above the point of introduction of said first blast of air at which formation of CO

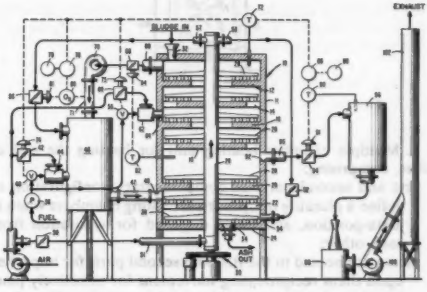


normally has ceased and where the temperature of the mixture of combustion gases and air is sufficiently high so that said mixture is self-igniting.

3,958,920
SYSTEM FOR CONTROLLING THE OPERATION OF A MULTIPLE HEARTH FURNACE

Robert J. Anderson, Charlotte, N.C., assignor to Rust Engineering Company, Birmingham, Ala.

Filed June 3, 1975, Ser. No. 583,423
Int. Cl.² F27B *9/02*; F23G *3/06*
U.S. Cl. 432—23 **26 Claims**



1. In a method for combusting a combustible material in a multiple hearth furnace having a plurality of superposed hearths defining an upper drying zone, an intermediate combustion zone and a lower cooling zone, said method comprising the steps of:

introducing a mixture containing the combustible material and water into the upper end of the furnace,

passing the mixture downwardly through the drying zone wherein the mixture is dried by exposure to gases heated in the combustion zone,

passing the dried mixture downwardly from the drying zone through the combustion zone wherein the combustible material is combusted using air as the oxidant, the gases produced by the combustion of said material flowing upwardly into the drying zone to provide heat for drying said mixture,

supplying air to the combustion zone to provide oxygen for combusting the combustible material,

passing the solid residue uncombusted by said combustion downwardly from the combustion zone through the cool-

ing zone wherein the residue is cooled by exposure to gases cooler than the gases produced by said combustion, and

removing the cooled residue from the lower end of the furnace;

the improvement comprising the steps of:

recirculating gases from the drying zone back into the combustion zone to provide relatively low temperature gases in the combustion zone for absorbing excess heat generated by said combustion,

sensing the temperature in the combustion zone, and

controlling the flow of said recirculated gases in response to said sensed temperature to provide the quantity of said recirculated gases in the combustion zone required to maintain said combustion zone temperature at a substantially constant predetermined temperature independently of the heat produced in the combustion zone.

3,958,921

MULTIPLE CHAMBER HEATING UNIT

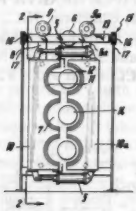
Hans-Richard Splitt, and Adolf Scherf, both of Duisburg, Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Mar. 5, 1975, Ser. No. 555,693

Claims priority, application Germany, Mar. 7, 1974, 2411280

Int. Cl.² F27B 9/14, 9/02

U.S. Cl. 432—122 **5 Claims**



1. Multiple chamber heating unit for heating the end of tubes, comprising:

first and second parts of complimentary configuration to define a plurality of cylindrical heating chambers when in juxta-position, and being disposed for separation from each other;

means connected to the first and second parts for imparting upon them reciprocating movement for selectively placing them into juxta-position and separating them from each other; and

means defining a rear wall for said chambers and carrying a plurality of heating elements respectively projecting into the cylindrical heating chambers from ends thereof adjacent said rear wall, a tube when inserted into a heating chamber being inserted from the other end thereof.

3,958,922

DUCT BURNER ASSEMBLY

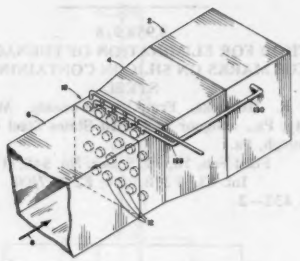
Hershel E. Goodnight, and Richard R. Martin, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Sept. 20, 1974, Ser. No. 507,692

Int. Cl.² F24H 3/14

U.S. Cl. 432—222 **19 Claims**

1. A burner assembly for use in hot exhaust gas ducts, said burner assembly comprising a plurality of multi-fuel burners arranged in a planar array transverse to the flow of said hot air within said duct for providing a flame at each burner directed with the flow of exhaust gas within said duct, flame scan means provided through the duct and in communication with each burner for monitoring each burner to determine the presence of flame thereat, said flame scan means comprising a plurality of straight scanner tubes disposed through the upper portion of the duct and extending downwardly, the lower portion of each said tube being in open communication



with each burner; said burner array comprising a plurality of columns of burners, each burner being offset laterally from the other burners in the column whereby the upper portion of each burner is exposed to the upper portion of said duct.

3,958,923

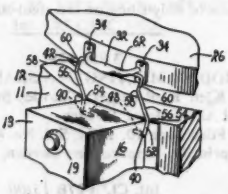
COMBINED KILN AND LID PROP

Richard F. Duncan, Fresno, Calif., assignor to Duncan Enterprises, Fresno, Calif.

Continuation-in-part of Ser. No. 509,425, Sept. 26, 1974, abandoned. This application June 12, 1975, Ser. No. 586,418

Int. Cl.² F27D 1/18

U.S. Cl. 432—250 **12 Claims**



1. In combination with a kiln having an oven providing an open upper end, a lid pivotally mounted on the kiln for movement about a fixed axis adjacent to the oven between a substantially horizontal closed position and an open position upwardly therefrom, and means integral with the lid having an arcuate path of movement as the lid is moved between open and closed positions; a lid prop mounted on the kiln adjacent to the oven at the side thereof opposite to said axis and upwardly extended for pivotal movement between a position disposed in the path of movement of said means to support the lid thereon and a position outwardly thereof.

3,958,924

FURNACE FITTINGS

John Egenolf, Shotley Bridge, and Stephen John Osborne, Richmond, both of England, assignors to Advanced Materials Engineering Limited, Gateshead, England

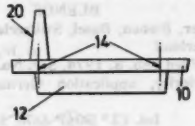
Filed Dec. 2, 1974, Ser. No. 528,978
Int. Cl.[2] F27B 21/00
U.S. Cl. 432—258 4 Claims

1. Furnace fittings for furnace firing green ceramic artefacts comprising:

a. a support base having plural mounting means,

b. and a plurality of artefact supporting means each having mounting means removably engaged with one of said base mounting means to removably mount said artefact supporting means on said base,

c. said support base and each of said artefact supporting means consisting of silicon nitride and being directly

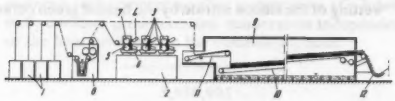


engageable with said green ceramic artefact without wetting of the silicon nitride by the heated green ceramic.

3,958,925
PROCESS AND APPARATUS FOR THE PRODUCTION OF BLENDS

Hans Fleissner, Riehen, Basel, Switzerland, assignor to Vepa AG, Switzerland

Filed Feb. 8, 1974, Ser. No. 440,758
Claims priority, application Germany, Feb. 8, 1973, 2306204
Int. Cl.² D06P *3/00*, *3/82*
U.S. Cl. 8—14 **10 Claims**

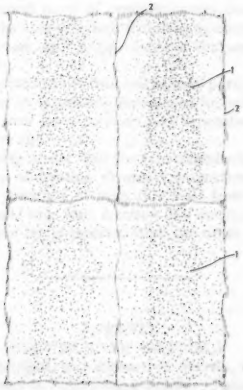


1. A process for the production of blends of fibers having two or more different colors which comprises, in a continuous operating procedure, passing a plurality of fiber slivers or strands of desired lengths together in mutually parallel relationship through at least one pair of printing rolls, and imprinting the fiber slivers or strands together in one operating stage with different colorants in varying thicknesses and amounts, based on a unit length or unit area of said fiber slivers or strands whereby a desired mixed color effect is obtained in said fibers.

3,958,926
RELIEF PRINTING ACRYLIC PILE FABRIC WITH DI-BETA-CYANOETHYL FORMAMIDE TO SIMULATE ANIMAL SKINS

Peter Fennekels, Kempen-Huls, and Ernst Waltmann, Krefeld, both of Germany, assignors to Firma Girmes-Werke AG, Grefrath-Oedt, Germany

Filed May 29, 1974, Ser. No. 474,195
Claims priority, application Germany, May 29, 1973, 2327290; June 30, 1973, 7324371[U]
Int. Cl.² D06P *5/00*
U.S. Cl. 8—15 **3 Claims**



1. A process for producing simulated animal skins by the sequential treatment to the pile side of pile fabrics, the steps which comprise

a. first selecting a pile fabric with the nap thereof being a member selected from the group consisting of polyacrylic pile fabrics, modified polyacrylic pile fabric and poly-as.-dicyanoethylene pile fabric;

b. first passing in a first treatment step said fabric from said selecting step through a first treatment zone and applying to the pile surface thereof a tinted printing paste to selected areas for providing the hue, tone and shade of said simulated animal skins;

c. after said first passing step, passing in a second treatment step said selected pile fabric through a second treatment zone and applying to the pile surface thereof a printing paste to selected areas, said printing paste containing within the range of between about 60 grams and 400 grams per kilogram of printing paste di-beta-cyanoethyl formamide, and

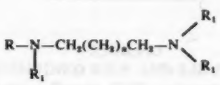
d. after said second treatment step, applying steam to the pile side of said selected pile fabric.

3,958,927
METHOD OF DYEING JUTE-BACKED POLYAMIDE CARPETING

Rudolf Heer, Marietta, Ga., assignor to Sandoz, Inc., Hanover, N.J.

Filed May 28, 1974, Ser. No. 473,520
Int. Cl.² D06B *3/82*
U.S. Cl. 8—21 B **6 Claims**

1. In a method for dyeing the jute of jute-backed polyamide carpeting containing already dyed cationic-dyeable polyamide carpet face fibers, the improvement which comprises the steps of: i) treating the jute-backed polyamide carpeting prior to the dyeing of the jute in a bath containing a water-soluble acid addition salt of a compound of the formula:



where

R is an aliphatic hydrocarbon group containing 8 to 24 carbon atoms,

each of R_1 is independently a hydroxyalkyl group of 2 to 3 carbon atoms, and

n is 0, 1 or 2,

or a mixture of said acid addition salts, at a temperature not exceeding 90°F. and at a pH of about 3 to 7, and ii) dyeing the jute of said treated jute-backed polyamide carpeting with at least one cationic dyestuff at a temperature not exceeding 90°F. and at a pH of from 3 to 11, whereby the jute is dyed and the carpet face fibers are substantially free from staining by said cationic dyestuff.

3,958,928
REDUCED-STAINING COLORANT SYSTEM FOR LIQUID LAUNDRY DETERGENTS

Robert J. Lala, River Edge, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed May 5, 1975, Ser. No. 574,487
Int. Cl.² C09B *1/28*, *1/32*; C11D *3/40*, *3/42*
U.S. Cl. 8—25 **3 Claims**

1. A liquid synthetic detergent composition having reduced staining characteristics, while retaining the ability to increase the apparent whiteness of fabrics comprising: about 0.006 to about 0.025 percent by weight of a dye mixture consisting essentially of about 0.0005 to about 0.0030 percent by weight of 1,4-bis(2-ethylhexylamino) anthraquinone and at least one soluble anthraquinone dye selected from the group consisting of 1-amino-2-sulfo, 4-(2-sulfo-para toluidino) anthraquinone sodium salt, 1,4-bis(3-sodium sulfonate-mesitylidino) anthraquinone and mixtures thereof; 0 to about 40 percent by weight of a nonionic detergent; about 5 to about 20 percent by weight

of an alkali metal or organic amine salt of an alkyl aryl sulfonate; 0 to about 30 percent by weight of a builder; about 3 to about 10 percent by weight of a hydrotrope; 0 to about 10 percent by weight of a stabilizer; and the balance water to 100 percent.

3,958,929

DYESTUFF PREPARATIONS

Reinhold Hornle, Cologne; Hans-Heinz Molls; Roland Rupp, both of Leverkusen, and Robert Kuth, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 8, 1974, Ser. No. 440,662

Claims priority, application Germany, Feb. 10, 1973, 2306612

Int. Cl.² C09B 67/00

U.S. Cl. 8—79 **5 Claims**

1. Pressings of uniform shape and uniform weight containing 5–50% by weight of a disperse dyestuff or an optical brightener with a solubility in water less than 0.5% at 20 C, 40–94.5% by weight of an anionic dispersing agent, and 0.5–10% by weight of a solid water-soluble mold release agent which gives a neutral to weakly alkaline reaction in water.

3,958,930

DEEP-DYED NYLON FIBER AND DYED STYLING YARN

Stanley Brooke Speck, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

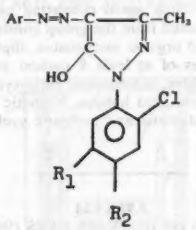
Division of Ser. No. 301,811, Oct. 30, 1972, Pat. No. 3,802,836. This application Oct. 31, 1973, Ser. No. 411,426

Int. Cl.² D06P 3/24

U.S. Cl. 8—26 **1 Claim**

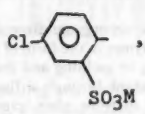
1. Styling yarn containing deep-dyed nylon fiber which has been dyed from an aqueous dye bath having a pH of 4–7 and which contains dyes selected from 2–3 of the following groups, wherein M in each group is a cation selected from H, Li, Na, K, NH_4, di(hydroxy-C_{2-3}alkyl)-ammonium and tri(hydroxy-C_{2-3}alkyl)ammonium:

1. Yellow dye of the structure



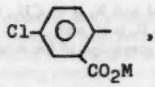
wherein

a. Ar is



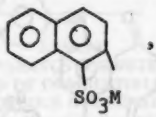
R_1 is Cl and R_2 is SO_3M,

b. Ar is



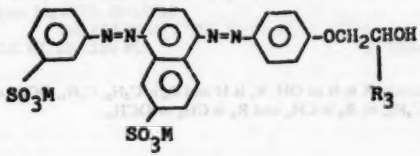
R_1 is Cl and R_2 is SO_3M, or

c. Ar is



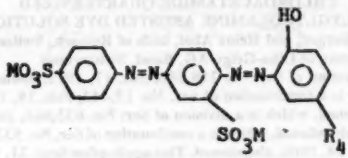
R_1 is SO_3M and R_2 is H;

2. Orange dye of the structure



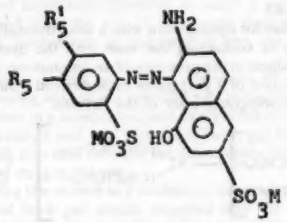
wherein R_3 is H, CH_3 or C_2H_5;

3. Orange dye of the structure



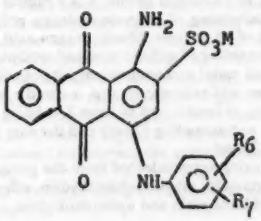
wherein R_4 is C_{1-8} alkyl

4. Red dye of the structure



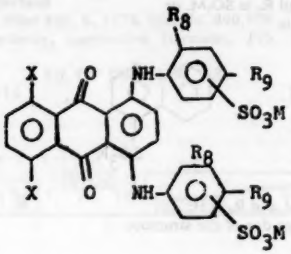
wherein one of R_5 and R'_5 is H and the other is C_6H_5CONH;

5. Blue dye of the structure



wherein R_6 is SO_3M and R_7 is H, CH_3, OCH_3 or Cl, or R_6 is p-$NHCOCO_2H$ and R_7 is H; and

6. Blue-green to green dye of the structure



wherein X is H or OH, R_8 is H and R_9 is C_2H_5, C_3H_7, OCH_3 or OC_2H_5, or R_8 is CH_3 and R_9 is CH_3 or OCH_3.

3,958,931

WOOL DYEING WITH EPIHALOHYDRIN OR CHLOROACETAMIDE QUARTERNIZED POLYGLYCOLAMINE ASSISTED DYE SOLUTION

Alfred Berger, and Heinz Abel, both of Reinach, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 218,586, Jan. 17, 1972, abandoned, which is a continuation of Ser. No. 12,442, Feb. 18, 1970, abandoned, which is a division of Ser. No. 833,866, June 3, 1969, abandoned, which is a continuation of Ser. No. 533,774, March 14, 1966, abandoned. This application Sept. 21, 1973, Ser. No. 399,574

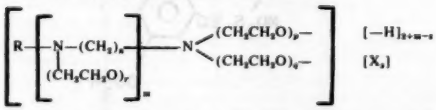
Claims priority, application Switzerland, Mar. 18, 1965, 3812/65

Int. Cl. D06P *1/68*

U.S. Cl. 8—43 **7 Claims**

1. A process for dyeing wool with a wool dyestuff, comprising the step of contacting the wool with the dyestuff in an aqueous medium in the presence of an amphoteric quaternary amine derivative of a polyglycol ester derived from

1. an amino-polyglycol ester of the formula



wherein R represents a linear aliphatic hydrocarbon radical selected from the group consisting of alkyl and alkylene radicals with 12 to 24 carbon atoms; X is a radical selected from the group consisting of monodeshydroxy polybasic oxygen acid radical of an at least dibasic oxygen acid selected from the group consisting of sulfuric acid and succinic-sulfonic acid and the alkali metal and ammonium salts of said monodeshydroxy oxygen acid radicals; *m*, *n*, *p*, *q*, *r* and *s* are whole numbers, *m* being at least 0 and at most 2, *n* being at least 2 and at most 3, *s* not exceeding (2+*m*) and the sum (*p*+*q*+*r*) being from 4 to 12; and

2. a quaternizing agent selected from the group consisting of chloroacetamide, ethylenechlorohydrin, ethylenebromohydrin, epichlorohydrin and epibromohydrin.

3,958,932

FLAME-RESISTANT TEXTILES THROUGH FINISHING TREATMENTS WITH VINYL MONOMER SYSTEMS

Stanley P. Rowland, and Florine A. Blouin, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 28, 1974, Ser. No. 501,418

Int. Cl.² D06M *13/44*, *13/46*

U.S. Cl. 8—115.7 **6 Claims**

1. A process for preparing cellulosic, cellulosic blend or synthetic fiber fabric having flame retardancy and durable-press properties comprising:

a. wetting a cellulosic, cellulosic blend or synthetic fiber fabric in an aqueous solution containing tetrakis(hydroxymethyl) phosphonium chloride, a nitrogeneous containing compound selected from the group consisting of a N-methylol acrylamide and an acrylamide, and a vinyl monomer selected from the group consisting of methylenebisacrylamide and 1,3,5,tri-acryloylhexahydro-s-triazine; and

b. curing the treated fabric from (a).

3,958,933

PROCESS FOR THE MANUFACTURE OF FAST DYEINGS ON SYNTHETIC HYDROPHOBIC TEXTILE MATERIAL

Gustaf Graff, Hillside, Ill.; Hans-Jorg Angliker; Richard Peter, both of Basel, Switzerland; Branimir Milicevic, Rhine, Switzerland; Hansruedi Hoster, Dornach, Switzerland, and Raymond Defago, Rhine, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 380,311, July 18, 1973, abandoned, which is a continuation of Ser. No. 170,951, Aug. 11, 1971, abandoned. This application May 13, 1974, Ser. No. 468,968

Claims priority, application Switzerland, Aug. 13, 1970, 12151/70

Int. Cl.² D06P *5/02*

U.S. Cl. 8—165 **18 Claims**

1. A process for dyeing synthetic hydrophobic textile material, which comprises dyeing the textile material with a disperse dyestuff containing a hydroxyl and/or a primary or secondary amino group and thereafter treating, at a temperature above 80°C, the dyed textile with a solution of a fixing agent in a chlorinated aliphatic hydrocarbon boiling above about 100°C, the fixing agent consisting essentially of an acylating agent selected from the group consisting of organic isocyanates, masked organic isocyanates, aliphatic monocarboxylic acid halides of at least 8 carbon atoms, aromatic carboxylic acid halides, heterocyclic carboxylic acid halides, aliphatic dicarboxylic acid halides, aliphatic polycarboxylic acid halides, and aliphatic and aromatic cyclic dicarboxylic acid anhydrides.

3,958,934

RAPID FIXATION OF DISPERSE DYES ON SYNTHETIC POLYMERS

Harold Leonard Jackson, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 367,333, June 5, 1973, abandoned. This application July 5, 1974, Ser. No. 486,115

Int. Cl.² D06P *1/68*

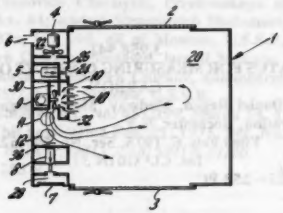
U.S. Cl. 8—174 **13 Claims**

1. Process wherein an organic disperse dye is applied to a synthetic organic polymer in the form of a film or textile fabric by spraying, printing or padding and the dye-containing film or fabric is then passed through a fluorocarbon fluid at a temperature greater than the glass transition temperature of the polymer for sufficient time to fix the dye in the polymer, said fluorocarbon having a boiling temperature of at least 125°C. and having a fluorine to carbon atom ratio of at least 1.5 and a solubility parameter of not greater than 7.0.

3,958,935
METHOD FOR DISINFECTING ROOMS AND ARTICLES THEREIN

Klaus Kowol, Lubeck, Germany, assignor to Dragerwerk Aktiengesellschaft, Germany

Filed May 9, 1974, Ser. No. 468,364
Claims priority, application Germany, June 30, 1973, 2333411
Int. Cl.² A61L 1/00, 9/02, 13/02
U.S. Cl. 21—58 3 Claims

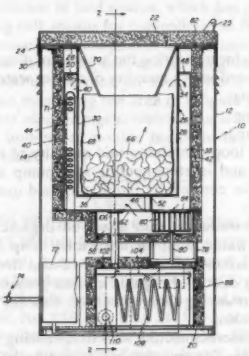


1. In a method of disinfecting chambers and articles therein comprising the steps of adding disinfectant to the air in the chamber to form a disinfectant gas, heating and circulating the disinfectant gas to disinfect the chamber and the articles therein, circulating fresh air through said chamber thereby exhausting the disinfectant gas from the chamber and scavenging the chamber, the improvement comprising following said fresh air circulating step by at least one residual disinfectant scavenging sequence of steps consisting of (a) heating the air remaining in the chamber to evaporate the residual disinfectant and after an expiration of a predetermined period of time, (b) circulating fresh air through the chamber to scavenge the chamber.

3,958,936
PLASTICS STERILIZER AND MELTER HAVING AN AFTERBURNER

Philip A. Knight, Jr., Concord, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed July 2, 1975, Ser. No. 592,429
Int. Cl.² A61L 3/00, 3/02; F27B 14/06, 14/08
U.S. Cl. 21—93 8 Claims

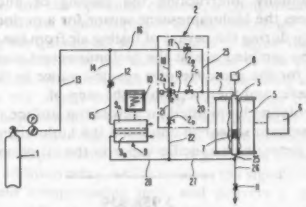


1. A furnace for melting and sterilizing plastic items comprising a first housing, a melting chamber within a portion of the first housing, an air circulation system within the first housing comprising a first air circulation chamber on one side of the melting chamber and communicating therewith, a heating element, a second air circulation chamber on the opposite side of the melting chamber and communicating therewith, and blower means connected with both said air circulation chambers for directing air into the first thereof, and consecutively through the heating element and through the melting chamber and through the second air circulation chamber, and afterburner means located outside of the first housing comprising a second housing connected with said air circulation system, heating means within said second housing, and second blower means for drawing some of the air from one of said air circulation chambers through the heating means.

3,958,937
METHOD AND APPARATUS FOR DETERMINING TOTAL OXYGEN DEMAND OF COMBUSTIBLE MATERIALS IN AQUEOUS DISPERSION

Yoshiki Shibata, Otsu; Hisami Fujino, Shiga; Sigeki Harano, and Hideo Kakigami, both of Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed June 4, 1974, Ser. No. 476,410
Claims priority, application Japan, June 7, 1973, 48-63388; June 13, 1973, 48-65810
Int. Cl.² G01N 27/26, 31/10, 31/12, 33/18
U.S. Cl. 23—230 PC 14 Claims



1. In a method for determining the total oxygen demand of a combustible material in an aqueous dispersion, with the use of a heated combusion chamber in which a catalyst bed is located, and with the use of an oxygen detector which is connected downstream of said catalyst bed, the steps which comprise:

a. supplying a feed gas stream composed of an inert gas containing oxygen at a constant rate into said combustion chamber in a manner to cause said stream to flow through said catalyst bed, and with the effluent gas from said bed flowing into said detector for determining the concentration of oxygen therein,

b. dividing the stream in a manner to decrease the flow rate of said feed gas stream supplied into the combustion chamber to a flow rate that is lower than that of the step (a) and diverting the balance of the feed gas stream to said detector while by-passing said chamber,

c. injecting a small amount of an aqueous dispersion of said combustible material into said combustion zone upstream of the catalyst bed while said flow rate of said feed gas stream is lower than that of step (a), whereby the combustible materials are burned in said gas, and

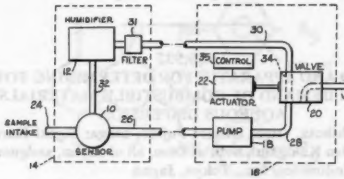
d. increasing the flow rate of said feed gas stream in said chamber to substantially the same flow rate as in step (a), whereby an electrical signal corresponding to the total oxygen demand for burning the combustible materials is generated,

the flow rate in step (b) being less than about 1/5 of the flow rate in step (a).

3,958,938
BIOLUMINESCENT SENSOR SYSTEM

Douglas D. Doonan, Rochester, N.Y., and Roy R. Sakaida, Woodland Hills, Calif., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Dec. 16, 1974, Ser. No. 533,096
Int. Cl.² C12K *1/04, 1/10;* G01N *33/16*
U.S. Cl. 23—230 B **5 Claims**



1. A bioluminescent humidification method for testing for the presence of a specific vapor in an air atmosphere, comprising the steps of:

recirculating humidified air during a non-testing period across the surface of a bioluminescent sensor to control the humidity of the bioluminescent sensor;

substantially interrupting the passing of humidified air across the bioluminescent sensor for a period of testing;

passing during the period of testing air from the atmosphere to be sampled across the bioluminescent sensor for testing for the presence of a specific vapor in the air atmosphere; and then repeating the step of

recirculating humidified air across the surface of the bioluminescent sensor to condition the bioluminescent sensor for detecting a specific vapor in the air atmosphere.

3,958,939
METHOD FOR CLARIFICATION OF LIPEMIC SERUM

Alan Richardson Jones, Miami, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Jan. 8, 1975, Ser. No. 539,401
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B **7 Claims**

1. A method for clarifying lipemic blood serum comprising the steps of forming an interface between a body of lipemic serum and a lipid-specific solvent having a specific gravity less than the serum and subjecting said interfaced liquids to a centrifugal field having a minimum field strength of 1,000 RCF for a predetermined duration while maintaining the integrity of said interface so that the solvent rides centripetally relative to the lipemic serum body, thereafter removing said interfaced liquids from said field and withdrawing one of the resulting solvent and serum layers without disturbing the other.

3,958,940
METHOD FOR THE REMOVAL OF PENETRANT

Edward F. Conway, Arlington Heights, Ill., assignor to Magnaflux Corporation, Chicago, Ill.

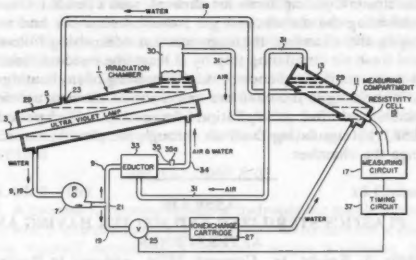
Filed Sept. 22, 1975, Ser. No. 615,406
Int. Cl.² G01N *31/02*
U.S. Cl. 23—230 L **9 Claims**

1. In the method of inspecting a test piece for surface flaws in which an oily based dyed penetrant is applied to the test piece and subsequently said test piece is treated with an emulsifying agent to remove excess penetrant from its surface, the improvement whereby said excess penetrant is rendered innocuous, said improvement comprising employing an aqueous soap solution as said emulsifying agent, the soap being a water soluble compound of a fatty acid containing from 12 to 20 carbon atoms, removing the emulsified penetrant by rinsing with an aqueous solution, collecting the emulsified penetrant, residual soap and rinse water, and treating the collected liquid with an aqueous solution of a water soluble calcium or magnesium salt to thereby form a readily filterable curd containing said oily based dyed penetrant and a substantially dye-free liquid layer.

3,958,941
APPARATUS FOR MEASURING CONTENT OF ORGANIC CARBON

Michael Daniel Regan, Medway, Mass., assignor to Sybron Corporation, Rochester, N.Y.

Filed Feb. 6, 1975, Ser. No. 547,622
Int. Cl.² G01N *31/12*
U.S. Cl. 23—253 PC **9 Claims**



1. Apparatus for measuring the amount of dissolved organic carbon introduced into a quantity of carrier water, said apparatus comprising:

a first housing

a water pump;

a first water loop containing said quantity of carrier water, including and interconnecting said pump and said first housing, for continually circulating said quantity of carrier water;

means for introducing said dissolved organic carbon into said first water loop; an ultraviolet lamp in ultraviolet communication with the interior of said first housing for irradiating dissolved organic carbon present in said first housing producing thereby carbon dioxide;

a second housing;

an air loop interconnecting said first housing and said second housing for transferring a portion of said carbon dioxide produced in said first housing into said second housing and for supplying oxygen to said first housing; and

measuring means for measuring the amount of carbon dioxide in said second housing said amount of carbon dioxide being representative of the amount of organic carbon introduced into the apparatus.

3,958,942

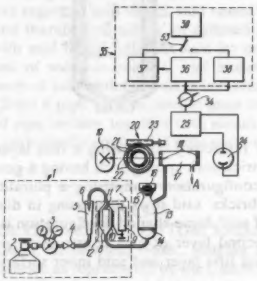
ANALYZER FOR DETERMINATION OF DOUBLE BONDS

Evgeny Mikhailovich Brazhnikov, Profsojuznaya ulitsa, 109, kv. 176; Viktor Ivanovich Gerbich, ulitsa Dovatora, 1/28, kv. 54; Igor Vladimirovich Krinsky, ulitsa Nametkina, 13, korpus 2, kv. 40; Dmitry Mitrofanovich Lisitsyn, Buturskaya ulitsa, 2/18, kv. 126; Vladimir Fedorovich Moskvin, Leninsky prospekt, 60/2, kv. 506; Stanislav Dmitrievich Razumovsky, Vorobievskoe shosse, 11, kv. 68; Evgeny Kalikstovich Russian, Vorobievskoe shosse, 11, kv. 62; Gennady Romanovich Truonikov, ulitsa Vavilova, 55/7, kv. 102; Vladimir Ivanovich Chernykh, Perekonskaya ulitsa, 14, korpus 2, kv. 44; Andrei Stepanovich Shalomeev, Lenisky prospekt, 37a, kv. 144, all of Moscow, U.S.S.R.; Nikolai Mikhailovich Chirkov, deceased, late of Moscow, U.S.S.R., and by Mikhail Nikolaevich Chirkov, administrator, ulitsa Vavilova, 55/7, kv. 6, Moscow, U.S.S.R.

Continuation of Ser. No. 451,299, March 14, 1974, abandoned. This application Feb. 21, 1975, Ser. No. 551,781

Int. Cl.[2] G01J *1/18;* G01N *21/26*

U.S. Cl. 23—253 R 12 Claims



1. An analyser for the determination of double bonds in organic compounds comprising: a reactor containing a compound to be tested having a gas outlet; a source of a gas mixture selected from the group consisting of ozone-oxygen and ozone-air mixtures in communication with said reactor; a measuring cell in communication with said gas outlet of said reactor; a source of ultraviolet radiation, with said measuring cell being mounted in the path of the radiation of said source; a receiver of ultraviolet radiation mounted in the path of ultraviolet radiation of said source, which has passed through said measuring cell; means for controlling the flux of ultraviolet radiation mounted in the path of the radiation between said source and said measuring cell; and an integrating unit operatively connected to said receiver of ultraviolet radiation, said integrating unit measuring the area of a figure described by a time-dependent electric signal which area is directly proportional to the number of double bonds in the organic compound being tested.

3,958,943

PROCESS TO PURIFY GAS CONTAINING HYDROGEN SULPHIDE BY MEANS OF AMINES

Michel Carmassi, Mazenes-Lezons; Bernard Louvel, Buros, and Georges Vandesande, Argagnon, all of France, assignors to Societe Nationale des Petroles d'Aquitaine, France

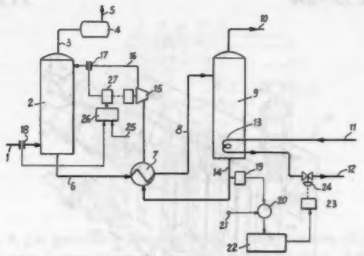
Division of Ser. No. 258,265, May 31, 1972, abandoned. This application Sept. 12, 1974, Ser. No. 505,520

Claims priority, application France, June 1, 1971, 71.19749

Int. Cl.[2] C01B *17/16;* G06F *15/46*

U.S. Cl. 23—255 R 3 Claims

1. In an apparatus for purifying gas containing at least hydrogen sulfide comprising an absorption zone for contacting a gas containing at least hydrogen sulfide with an amine solution with inlet and outlet means for said gas and amine solution, a regeneration zone containing heating and heat regulating means for regenerating said amine solution containing absorbed hydrogen sulfide by heat, said regeneration zone having inlet and outlet means, conduit means to conduct said gas to said absorption zone, conduit means connecting said absorption zone to said regeneration zone to carry liquid effluent from said absorption zone to said regeneration zone, conduit means for recycling regenerated amine solution to said absorption zone; the improvement which comprises an analyzer to measure the sulphur content of said regenerated amine solution, a subtractor producing a signal proportional to the difference between the sulphur content as measured by



the analyzer, and the optimum content, a compensating unit producing from the signal supplied by the subtractor, a signal representing the quantity of steam needed to adjust the immediate sulphur content of the amine solution to the optimum level, and means of altering the flow of regenerating steam in response to the signal representing the quantity of steam needed for adjustment, a computer which produces a signal representing the theoretical quantity of steam needed to obtain optimum sulphur content in the regenerated amine solution, and an addition relay, which receives the signals from the computer and compensating unit, and delivers a resulting signal to control the steam-flow regulation system.

3,958,944

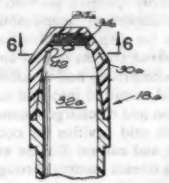
VIAL ASSEMBLY

Johnson N. S. Wong, 1021 Ashbridge Lane, Harbor City, Calif. 90710

Filed July 15, 1974, Ser. No. 488,384

Int. Cl.[2] B01L *3/14*

U.S. Cl. 23—259 4 Claims



1. A vial assembly, comprising:

an elongate cylindrical vial open at one end;

a cap for said vial closely but removably fitted on said one end, said cap having a top wall spaced from the open end of said vial and a dependant cylindrical side wall defining a compartment in communication with the interior of said vial, said cap and vial having substantially equal inner diameters at their junction; and

material comprising a major portion of activated charcoal; said dependent cylindrical cap wall being formed with plural protrusions into said compartment spaced substantially equidistant from said top wall to constitute reten-

tion means for successively securing, releasing and again securing said material within said cap compartment against the inner surface of said top wall and spaced from the open end of said vial.

3,958,945

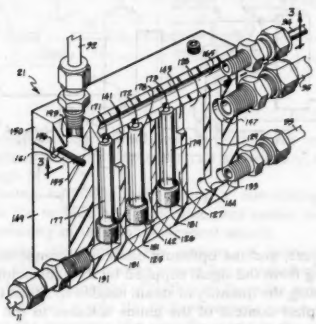
SPARGING DEVICE

Yoshihiro Takahashi, San Francisco, Calif., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Oct. 4, 1974, Ser. No. 511,970

Int. Cl.² C02D *1/00*; G01N *33/18*; B01L *3/00*

U.S. Cl. 23—259 **2 Claims**



1. A device for sparging carbon dioxide from an acidified aqueous stream for use in a system for quantitatively determining the organic carbon content of the stream comprising:

a. a generally non-foraminous body having a first cavity, a last cavity and between them a plurality of cavities, each generally vertically extending and formed therethrough;

b. an inlet port formed in said body in fluid-flow communication with said first cavity for admitting an acidified aqueous stream into the body;

c. passageways connecting said cavities in series so that the aqueous stream travels the length of each of said cavities before passing into the next;

d. an outlet port formed in said body in fluid-flow communication with the lower end of said last cavity for discharging the sparged aqueous stream from said body;

e. a manifold formed in said body and communicating with means to supply sparging gas into said manifold;

f. sparging gas dispersion means mounted in at least two of said cavities for dispersing fine bubbles of sparging gas into the aqueous stream in said cavities, said gas dispersion means comprising hollow tubes which carry sparging gas from said manifold into said cavities;

g. gas collection and discharge means in fluid flow communication with said cavities for continuously discharging sparging gas and carbon dioxide which has evolved from the aqueous stream passing through the cavities; and

h. means to maintain a predetermined liquid level within said cavities, said means including a liquid outlet port formed in said body in fluid flow communication with the upper end of said last cavity.

3,958,946

CARBON BLACK REACTOR

Charles R. Venable, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 6, 1975, Ser. No. 556,124

Int. Cl.² F27D *1/16*; C01B *49/00*

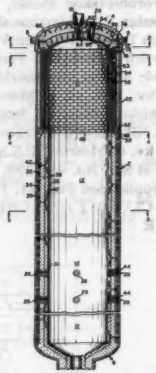
U.S. Cl. 23—259.5 **5 Claims**

1. A carbon black reactor comprising:

a. an insulated chamber;

b. a first closure at a first end of said chamber; and

c. a second closure at a second end of said chamber; said first closure being adapted with reactant inlet means in communication with said chamber and said second closure being adapted with product outlet means in communication with said chamber, wherein said first closure has a concave inner surface, and is insulated by at least two



layers of refractory comprising a first layer of self-supporting brickwork sprung arch having a generally dome-shaped configuration comprising a plurality of annular rows of bricks, said rows decreasing in diameter as the center of said dome-shaped configuration is approached, and a second layer of cast construction positioned between said first layer and said inner surface of said first closure.

3,958,947

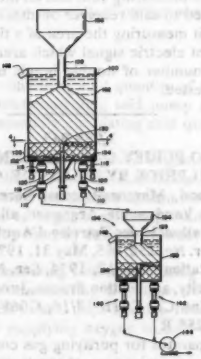
HYDROMETALLURGICAL LEACHING APPARATUS

Charles W. Robinson, San Francisco, and Kenneth E. Merklin, Tiburon, both of Calif., assignors to Marcona Corporation, San Francisco, Calif.

Division of Ser. No. 411,912, Nov. 1, 1973, abandoned, and a continuation-in-part of Ser. No. 305,144, Nov. 9, 1972, abandoned. This application Oct. 29, 1974, Ser. No. 518,737

Int. Cl.² B01D *11/02*

U.S. Cl. 23—270 R **8 Claims**



1. In apparatus for hydrometallurgical leaching of minerals, an upright vessel having substantially vertical side walls and a

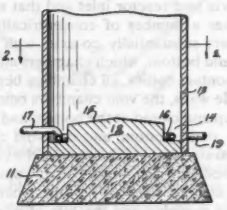
substantially horizontal bottom wall, means for forming a solid discharge outlet in the bottom wall comprising a plurality of horizontally spaced outlet openings of sufficient size to pass the solids, means including a rotatably mounted jet nozzle free of raker arms positioned upwardly from the bottom wall of said vessel and radially directed laterally outward in an essentially horizontal plane from a substantially vertical axis for supplying leaching liquid in at least one stream directed generally parallel to said bottom wall from a position generally thereabove, said last named means being under sufficient pressure to vigorously agitate solids in the path of said stream, independent drive means for progressively rotating said jet nozzle to cause liquid in said stream to sweep over the bottom wall of said vessel, means for delivering solids to the upper region of said vessel, a liquid overflow discharge formed at the upper end of said vessel whereby leaching liquid being introduced at the bottom passes upwardly through the solids contained within said vessel in counter-current flow in relation to the downward moving solids contained therein and thence becoming an overflow from said vessel, means for receiving the overflow and for removing any solids content therefrom, means for returning at least a portion of the solids-free overflow to a lower region of said vessel, said vessel being flooded with liquid and thereby containing an agitated zone of solids in contact with said liquid adjacent said jet nozzle, with an overlying zone of solids-in-contact, and outlet means associated with each of said outlet openings including a discharge trap formed from a pipe section, and at least one valve connected to said pipe section, together with means for operating said valve to periodically empty said pipe section through said valve.

3,958,948

DISSOLVER VESSEL BOTTOM ASSEMBLY

Douglas C. Kilian, Kennewick, Wash., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 8, 1975, Ser. No. 539,547
Int. Cl.² B01D *11/02*; **B01F** *1/00*
U.S. Cl. 23—271 R **1 Claim**



1. A bottom assembly for a nuclear reactor fuel reprocessing dissolver vessel comprising:

a. a shock-absorbing upright cylindrical crash plate have a slightly convex upper surface disposed within said dissolver vessel at the bottom thereof and spaced from said dissolver vessel wall so as to provide an annular space therebetween, the width of said annular space being less than the diameter of the nuclear reactor fuel elements to be dissolved;

b. a sparging ring disposed within said annular space; and

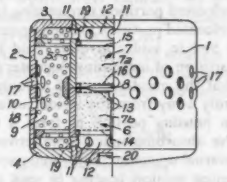
c. inlets and outlets communicating with said annular space to permit a fluid entering through the inlets to flush solids accumulated in the annular space from the vessel through the outlets, said inlets being disposed tangential to said annular space so as to induce a circular motion to the fluid around said annular space, said outlets being disposed tangential to said annular space and oppositely facing said inlets.

3,958,949

GAS GENERATOR WITH A COMBUSTION CHAMBER LATERALLY SURROUNDED BY A COOLING CHAMBER

Bernard E. Plantif, Saint Medard-en-Jalles; Michel C. Pasquier, Merignac, and Jean-Francois Tillac, Bordeaux Caudéran, all of France, assignors to Societe Nationale des Poudres et Explosifs, France

Filed June 6, 1974, Ser. No. 476,849
Claims priority, application France, June 26, 1973, 73.23306
Int. Cl.² B01J *7/00*
U.S. Cl. 23—281 **7 Claims**



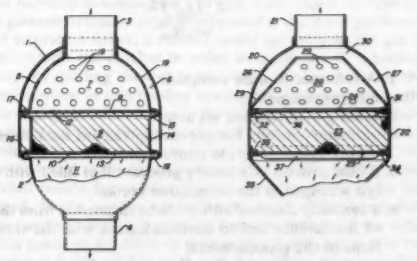
1. A gas generator for producing a large volume of gases at moderate temperature in an extremely short time, stable during firing, which comprises an essentially cylindrical casing closed at its ends by two substantially circular plates, a cylindrical partition coaxial with said casing dividing the space within said casing into a combustion chamber containing a pyrotechnic charge and an ignition device therefor and a cylindrical cooling chamber completely surrounding the combustion chamber and adapted to contain at least one solid material for cooling the gases produced on ignition of the pyrotechnic charge, first orifices between the cooling chamber and the combustion chamber to allow passage of the combustion gases from the combustion chamber to the cooling chamber, said orifices being located essentially at both ends of said partition, second orifices arranged radially in the wall of the casing to permit discharge of the combustion gases which have passed through the cooling chamber, a homogenization space in the combustion chamber located above and below said pyrotechnic charge, the second orifices in the wall of the casing being disposed symmetrically with respect to the axis of the casing.

3,958,950

COMPACT EXHAUST GAS CONVERTER WITH PULSE DAMPENING MEANS

Ted V. DePalma, Schaumburg, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Mar. 20, 1974, Ser. No. 453,128
Int. Cl.² B01J *8/00*, *8/02*; **F01N** *3/15*
U.S. Cl. 23—288 F **3 Claims**



1. In an internal combustion engine exhaust gas converter having opposing inlet and outlet means to channel the exhaust

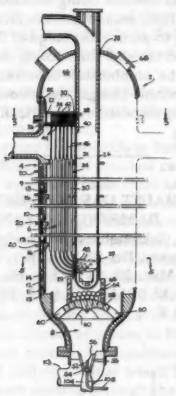
gas stream through a catalyst bed retained between spaced apart generally transverse perforated partitions, the improved construction and arrangement to dampen pulsations in the gas stream and substantially eliminate damage to the catalyst in said bed which comprises in combination, a hemispherical-form housing portion in interconnection with said gas inlet end of said converter, and an internal, upstream, transverse perforated partition within and spaced from said hemispherical-form housing, said internal upstream perforated partition having a large unobstructed upstream opening in alignment with said converter inlet means to receive the exhaust gas stream therefrom and an increasing diameter in the direction of the gas flow from the converter inlet means, said internal upstream, perforated partition terminating at and abutting the transverse perforated partition located upstream at the face of said catalyst bed in said converter, said internal upstream perforated partition of increasing diameter being shaped and sized such that the greater part of its outer wall surface is spaced inwardly away from the inside surface of said hemispherical-form housing portion to form a tapering annular-form gas pulse absorbing space therebetween, and to define within said internal upstream perforated partition an enlarging gas inlet plenum section leading to said catalyst bed, said internal upstream perforated partition permitting gas flow outwardly into said pulse absorbing space, whereby to thus dampen said pulsations in the gas stream.

3,958,951

CONVECTIVE POWER REFORMER EQUIPMENT AND SYSTEM

Herman N. Woebcke, Wayford, and Chi Sheng Kuo, Scituate, both of Mass., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Filed Apr. 9, 1974, Ser. No. 459,311
Int. Cl.² B01J *8/06*; C01B *1/18*
U.S. Cl. 23—288 M **15 Claims**



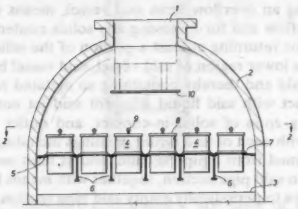
1. A reformer furnace comprising:
a. a burner assembly;
b. a hot gas convection section;
c. refractory means for preventing radiant heat from the burner assembly to the convection section;
d. a fluid process side having process tubes filled with catalyst arranged in the convection section;
e. a centrally disposed effluent tube suspended from the top of the furnace and in communication with the terminations of the process tubes;
f. a tube sheet suspending the process tubes, which tube sheet has a centrally disposed opening;
g. means to attach the tube sheet to the centrally disposed effluent tube at the tube sheet centrally disposed opening for support of the tube sheet by the centrally disposed effluent tube; and
h. means for joining the tube sheet to the inside wall of the furnace convection section in sealed relationship.

3,958,952

REACTOR HAVING A CATALYTIC BED WITH UPSTREAM MEANS FOR FILTERING SOLID CONTAMINANTS

Adriaan J. J. van Ginneken, The Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed May 6, 1974, Ser. No. 467,036
Claims priority, application United Kingdom, May 16, 1973, 23243/73
Int. Cl.² B01J *8/02*; B01D *27/08*, *27/10*
U.S. Cl. 23—288 R **4 Claims**



1. In an apparatus for the catalytic reaction of a material selected from the group consisting of gaseous and liquid materials and mixtures thereof said material containing solid contaminants, comprising a reactor having an upstream inlet and an outlet and containing at least one bed of catalyst and disposed in said reactor upstream of said catalyst bed a tray supporting a plurality of filter units for removing said contaminants from said material, the total surface area of the filter units being substantially higher than the cross sectional area of the reactor, the improvement comprising that said filter units are arranged and constructed on said tray for individual replacement via said reactor inlet and that each of said filter units comprises a number of concentrically disposed elongated chambers substantially co-axial with the reactor and having a top and bottom, which chambers alternately are void and contain contact bodies, all chambers being provided with permeable side walls, the void chambers being alternately (1) open at the top and closed at the bottom and (2) closed at the top and open at the bottom, and said void chambers (1) and (2) being separated from each other by the chambers containing contact bodies, said contact body-containing chambers being closed at both top and bottom, whereby a high filter surface area is available and the rate of pressure differential build-up across the filter units is slow.

3,958,953

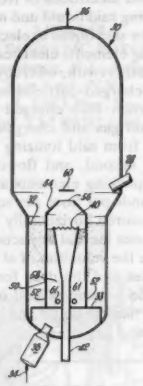
CATALYST REGENERATION APPARATUS

Edward C. Luckenbach, Mountainside, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 451,805, March 18, 1974, Pat. No. 3,902,990. This application Dec. 18, 1974, Ser. No. 533,987
Int. Cl.² C10G *11/18*; B01J *8/08*
U.S. Cl. 23—288 B **4 Claims**

1. In a regenerator vessel adapted to contain a bed of fluidized catalyst, which comprises: a section of a standpipe having a enlarged diameter open end forming an overflow well for withdrawing regenerated catalyst from said regenerator vessel, said standpipe section being disposed in concentric relation to the vertical axis of said regenerator vessel; catalyst inlet means; catalyst outlet means; gas outlet means, and gas inlet means, the improvement which comprises: a cylindrical baffle disposed around an upper portion of said standpipe section,

said baffle comprising at least one orifice at its lower portion for direct passage of catalyst from said fluidized bed into an annular zone formed by said cylindrical baffle and said section



of standpipe, and means for introducing a gas into said annular zone, said catalyst inlet means being positioned at a spaced distance above said standpipe, whereby said catalyst is introduced above said bed of fluidized catalyst.

3,958,954

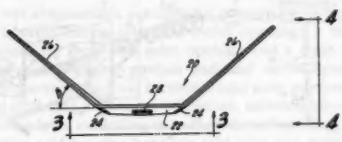
CONCRETE WELDMENT

Gary James Ehlenbeck, 4530 N. Oakland Ave., Milwaukee, Wis. 53211

Filed June 13, 1975, Ser. No. 586,715

Int. Cl.² E04B 1/21

U.S. Cl. 29—183.5 **16 Claims**



1. An embeddable metallic weldment for joining cementitious members, said weldment being formed from a sheet material of suitable thickness and comprising:

a central plate-like portion presenting a planar, weldable surface disposed at an angle to the perpendicular; and

a pair of tails one of which extends from either end of said central portion, said tails being divergingly bent out of the plane of said central portion, said tails being tapered toward their extremities for substantial portions of their length.

3,958,955

FUEL COMPOSITIONS AND ADDITIVE MIXTURES CONTAINING CARBOXYMETHOXY PROPANEDIOIC ACID ESTERS FOR ALLEVIATION OF EXHAUST GAS CATALYST PLUGGING

Marcelian F. Gautreaux, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed July 7, 1975, Ser. No. 593,621

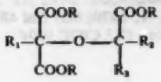
Int. Cl.² C10L 1/18

U.S. Cl. 44—68 **23 Claims**

1. As a composition of matter, a gasoline for an internal combustion engine comprising

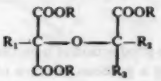
i. an antiknock amount of a cyclopentadienyl manganese tricarbonyl antiknock compound, and

ii. an amount sufficient to reduce plugging of an exhaust gas catalyst of a compound having the general formula:



wherein R is independently selected from hydrogen, hydrocarbyl radicals, alkali metal, or ammonium, R_1 is selected from hydrogen, hydrocarbyl radicals, R_2 is selected from hydrogen, hydrocarbyl radicals, and R_3 is selected from hydrogen, hydrocarbyl radicals, or COOR.

17. The additive fluid of claim **15** wherein said fluid contains an amount sufficient to reduce the plugging of an exhaust gas catalyst of the compound having the general formula:



3,958,956

METHANE PRODUCTION PROCESS AND ARRANGEMENT THEREFOR

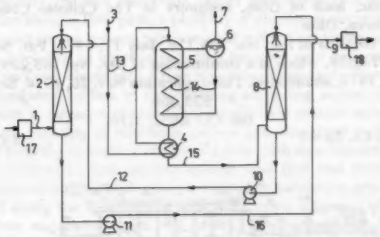
Eberhard Goeke, Essen, Germany, assignor to Krupp-Koppers GmbH, Essen, Germany

Filed July 9, 1974, Ser. No. 486,928

Claims priority, application Germany, July 13, 1973, 2335659

Int. Cl.² B01J 1/00; C07C 9/04, 27/06

U.S. Cl. 48—62 R **12 Claims**

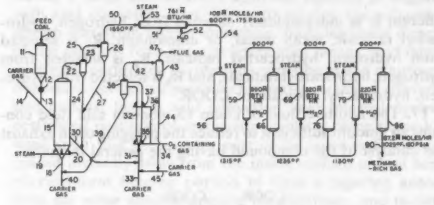


9. An apparatus for methanizing the gaseous product obtained in the partial oxidation of coal or heavy hydrocarbon oil, the said apparatus comprising a saturation tower for at least partially saturating the gas with water vapor, an inlet for the gaseous oxidation product disposed at the lower portion of said saturation tower, a reactor vessel for bringing the gas in contact with the catalyst in order to methanize it, a cooling tower for cooling the hot methanized gas, an outlet at the upper portion of said cooling tower for discharging the methanized gas, gas conduit means for passing the at least partially saturated gas from the top portion of the reactor vessel and for passing the methanized gas from the bottom portion of the reactor vessel to the lower portion of the cooling tower, water conduit means for passing high temperature water from the bottom of the cooling tower to the head of the saturation tower and passing cooling water from the bottom of the saturation tower to the head of the cooling tower and means for withdrawing the cooled methanized gas from the apparatus, the said means for passing heated water and means for passing cooling water, together with said two towers, forming a closed flow circuit.

3,958,957
METHANE PRODUCTION

Kwang K. Koh, Seabrook; Robert E. Pennington, Baytown; Lonnie W. Vernon, Baytown, and Nicholas C. Nahas, Baytown, all of Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed July 1, 1974, Ser. No. 485,041
Int. Cl.² C07C 9/04
U.S. Cl. 48—197 R **18 Claims**

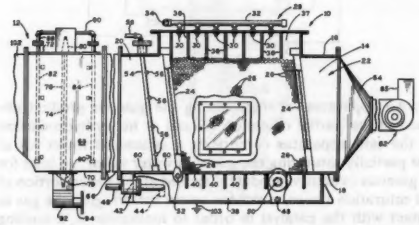


1. A method for the production of a methane-rich gas which comprises introducing a gaseous mixture of hydrogen and at least one carbon oxide into a reaction zone containing a carbon-alkali metal catalyst at a temperature between about 800° F. and about 1500° F. and at a pressure between about atmospheric and about 2000 psig, said catalyst being prepared by heating an intimate mixture consisting essentially of a carbonaceous solid and an alkali metal constituent to an elevated temperature sufficient to produce a reaction between the carbon and alkali metal in said mixture and form a carbon-alkali metal reaction product, and recovering a methane-rich gas from said reaction zone.

3,958,958
METHOD FOR ELECTROSTATIC REMOVAL OF PARTICULATE FROM A GAS STREAM

Warren L. Klugman, Berea, and Jerome Kosmider, Strongsville, both of Ohio, assignors to The Ceilcote Company, Berea, Ohio

Division of Ser. No. 378,278, July 11, 1973, Pat. No. 3,874,858, which is a continuation of Ser. No. 165,209, July 22, 1971, abandoned. This application Nov. 20, 1974, Ser. No. 525,308
Int. Cl.² B03C 3/16
U.S. Cl. 55—7 **3 Claims**

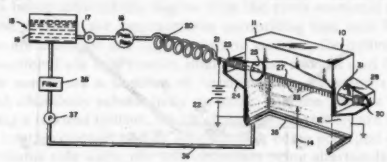


1. In a method of removing particles from a gas stream by flowing the gas through a chamber containing only packing elements of dielectric material and continuously flowing liquid downwardly through the packing elements for said liquid to flow through said chamber in droplet form and in contact with said packing elements, whereby some particles in said gas stream are removed from the gas by inertial impaction with said packing elements and liquid droplets as said gas flows therepast, and others of the particles are retained in the gas stream by the drag force of the gas stream thereon and flow around said packing elements and liquid droplets with the gas, the improvement which comprises the steps of: flowing said gas through an ionizing zone upstream of said chamber to impart an electrical charge to the particles in said gas stream without intentional particle collection in said ionizing zone, said ionizing zone comprising spaced electrodes, applying a potential between said electrodes of from 5 to 150 kilovolts, electrically neutralizing said liquid and maintaining said liquid electrically neutral for said liquid to electrically neutralize and maintain said packing elements electrically neutral by continuous flow in contact therewith, whereby a force of attraction exists between said charged particles and neutral liquid and packing elements when said charged particles enter said chamber, flowing said gas and charged particles directly to said enclosed space from said ionizing zone at a velocity of from 1–10 feet per second, and flowing said liquid downwardly through the packing elements at a flow rate of from 1,000 to 12,000 pounds per hour per square foot of the area of said chamber measured horizontally thereof, for the force of attraction to enhance inertial impaction of said some particles and to overcome the velocities of at least a portion of said others of the particles and the drag force of the gas stream thereon, whereby said portion of said others of the particles are attracted to said neutral liquid and packing elements and thus removed from said gas stream.

3,958,959
METHOD OF REMOVING PARTICLES AND FLUIDS FROM A GAS STREAM BY CHARGED DROPLETS

Ernest Cohen, Palos Verdes Estates; Marshall N. Huberman, Los Angeles; Walter F. Krieve, Rancho Palos Verdes, and Charles W. Lear, Los Angeles, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 303,017, Nov. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 61,224, Aug. 5, 1970, abandoned. This application Aug. 5, 1974, Ser. No. 495,013
Int. Cl.² B03C 3/16
U.S. Cl. 55—10 **12 Claims**



1. The method of removing from a gas stream undesirable fluid components and particulate matter entrained thereby, by utilizing spaced, conducting elements and a spray tube disposed between the elements, the method comprising the steps of:

a. causing the gas stream to flow between the elements and past the spray tube;
b. forcing a liquid through the spray tube into the gas stream at substantially atmospheric pressure to generate a liquid jet;
c. applying a steady electric potential of substantially 50 kilovolts to 60 kilovolts between the liquid jet and the spaced elements, the potential being sufficiently large to break up the liquid jet by the resultant electrostatic field into individual droplets having a diameter between aproximately 60 microns and approximately 250 microns, each droplet having a high surface charge density;
d. causing the charged droplets to flow toward the elements at an angle with respect to the direction of flow of the gas stream to provide a relative velocity between the gas stream and the droplets, whereby the droplets will collide with individual particles or undesirable fluids to remove them; and

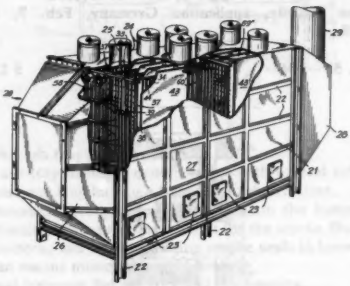
e. eventually causing the droplets to move toward the elements due to the electrostatic field where they collide and collect.

3,958,960

WET ELECTROSTATIC PRECIPITATORS

Even Bakke, New Providence, N.J., assignor to United States Filter Corporation, New York, N.Y.

Filed Feb. 2, 1973, Ser. No. 329,269
Int. Cl.² B03C 3/16
U.S. Cl. 55—118 41 Claims



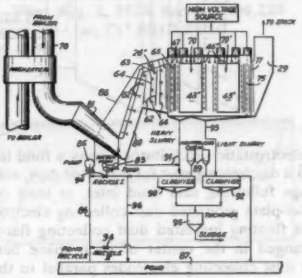
1. A wet electrostatic precipitator comprising, in combination, a housing having inlet and outlet openings, a diverging portion leading from said inlet opening and a main portion between said diverging portion and said outlet opening; at least one electrostatic field section in said main portion of said housing including a plurality of spaced, substantially parallel collection plates extending in a flow direction along a flow path within said housing between said inlet and outlet openings, a plurality of discharge electrodes interposed in the spaces between said collection plates and means applying an electric potential between said collection plates and said electrodes; inlet means in said housing extending from said inlet opening, directing a gaseous medium, containing material to be precipitated, to flow between said collection plates along said path; means directing continuous sprays of washing liquid droplets into the spaces between and against said collection plates; a plurality of relatively narrow and elongated baffles in said diverging portion of said housing for distributing the gaseous medium and collection of a portion of the material to be collected, said baffles extending transverse to the flow path intermediate said inlet opening and said electrostatic field section and arranged in at least two successive rows, the width of each baffle being said narrow dimension measured as the projection of said baffle on a plane extending normally to the flow path in the region of the baffles, the lateral spacing between the baffles in each row being selected to substantially equalize the distribution of the gaseous medium in said main portion of said housing in the region of said parallel collection plates, said lateral spacing being in excess of the width of the baffles, and with the baffles of each row being laterally staggered relative to the baffles of adjacent rows of baffles and means directing continuous sprays of washing liquid against the upstream faces of said baffles.

3,958,961

WET ELECTROSTATIC PRECIPITATORS

Even Bakke, New Providence, N.J., assignor to United States Filter Corporation, New York, N.Y.

Division of Ser. No. 329,269, Feb. 2, 1973. This application Oct. 15, 1974, Ser. No. 514,973
Int. Cl.² B03C 3/16
U.S. Cl. 55—118 11 Claims

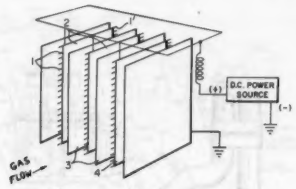


1. A wet electrostatic precipitator for use with a coal fired boiler having a flue gas outlet comprising, in combination, a housing having inlet and outlet openings; electrostatic field section means in said housing including a plurality of spaced, substantially parallel collection plates extending in a flow direction along a flow path, a plurality of discharge electrodes interposed in the spaces between said collection plates, and means applying an electric potential between said collection plates and said electrodes; a first plurality of relatively narrow and elongated baffles in said housing extending across said flow path in advance of said electrostatic field section means; a second plurality of relatively narrow and elongated baffles in said housing extending across said flow path downstream of said electrostatic field section means, said first and second pluralities of baffles each being arranged in successive groups spaced along the flow path, each group being arranged in at least two successive rows, the lateral spacing between the baffles in each row of said first plurality of baffles being greater than the width of the baffles, the lateral spacing between baffles in each of said second plurality of baffles being equal to or less than the width of the baffles, successive rows of said first and second pluralities of baffles being staggered laterally relative to each other; inlet means including said inlet opening and connected by said inlet opening to said flue gas outlet of a coal fired boiler and directing the flue gases, containing flyash and SO_3 to be precipitated, to flow between said collection plates along a flow path within said housing;means directing continuous sprays of washing liquid into the spaces between and against said collection plates; hopper means positioned below said electrostatic field section means and collecting therefrom a slurry formed of the washing liquid and the precipitated flyash and SO_3, said housing having openings communicating with said hopper means; clarifier means connected to said hopper means to receive the slurry therefrom; means supplying neutralizing chemicals to said clarifier means; said clarifier means separating the slurry into a sludge, containing the flyash, and a liquor; and a recycle pump operable to recycle the liquid to said spray means as the washing liquid to increase the effectiveness of SO_3 absorption by the washing liquid.

3,958,962
ELECTROSTATIC PRECIPITATOR

Tsutomu Hayashi, Yokohama, Japan, assignor to Nafco Giken, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 347,385, April 3, 1973, abandoned. This application Oct. 15, 1973, Ser. No. 406,159
Claims priority, application Japan, Dec. 30, 1973, 48-1359
Int. Cl.² B03C *3/24*
U.S. Cl. 55—148 4 Claims

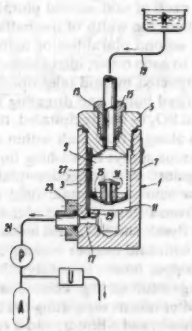


2. An electrostatic precipitator having a fluid inlet, a fluid outlet and a discharging port for collected dust, comprising; a gas passage following said fluid inlet, at least one pair of spaced, flat-plate grounded dust collecting electrodes in said passage, a floating insulated dust collecting flat-plate electrode arranged in the center of each space between said grounded dust collecting electrodes parallel to the gas flow and provided at its edges at fixed intervals with sets of needle-shaped discharge electrodes extending in the plane of said electrode on opposite sides thereof, one set of said needle-shaped electrodes facing the gas flow and the other set facing in the opposite direction said needle-shaped electrodes being circular in cross section, said grounded dust collecting electrodes and said floating dust collecting electrode being placed in parallel to each other and a plurality of said electrodes being spaced at substantially equal intervals, and means selectively connecting the needle-shaped discharge electrodes and the floating dust collecting electrodes and the grounded dust collecting electrodes in a DC circuit to charge them respectively at opposite electrical polarity.

3,958,963
FILTER FOR LIQUIDS CAPABLE OF CONTAINING A GAS

Jean Louis Gratzmuller, 66 Boulevard Maurice Barres, 92200 Neuilly-sur-Seine, France

Filed July 30, 1974, Ser. No. 493,659
Claims priority, application France, Aug. 8, 1973, 73.28952
Int. Cl.² B01D *29/42*
U.S. Cl. 55—159 4 Claims

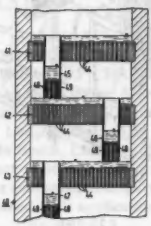


1. A filter for liquids capable of containing a gas, said filter comprising a chamber for through-passage of a gas-charged liquid; a filtering element arranged in said chamber and subdividing said chamber into an upstream compartment and a downstream compartment; a liquid-supply pipeline opening into said upstream compartment; a liquid-outlet pipeline issuing from said downstream compartment, the working section of the outlet pipeline being smaller than the working section of the supply pipeline; and an auxiliary conduit for intake of gas directly communicating between said liquid-outlet pipeline and the upper part of said downstream compartment, said auxiliary conduit opening into said outlet pipeline through a constricted orifice functioning as a nozzle.

3,958,964
APPARATUS FOR BRINGING GASES AND LIQUIDS INTO CONTACT

Christian Koch, Nurnberg-Grossgrundlach, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 6, 1974, Ser. No. 439,882
Claims priority, application Germany, Feb. 7, 1973, 2306008
Int. Cl.² B01D *3/18*
U.S. Cl. 55—186 5 Claims



1. An apparatus for facilitating absorption of gases or vapors by a liquid or desorption of gases or vapors from a liquid which comprises:

a. a column housing;

b. a plurality of plates having a predetermined thickness and a cross-sectional area, fabricated from a porous, sintered material, each of said plates having a plurality of parallel passage openings of predetermined cross-sectional area, therethrough said plates positioned horizontally within said column at a predetermined distance from each other;

c. means for introducing said liquid at the head of said column;

d. means for introducing said gases or vapors at the sump end of said column;

e. a plurality of run-off means communicating between the space above and below each plate, said run-off means carrying a portion of said liquid from the top of one of said plates to said space below, each of said run-off means being comprised of a tube having a predetermined height and diameter such that the portion of the liquid in a given tube exerts a greater pressure on the gas below a corresponding plate than corresponds to the difference between the gas pressure above and below said corresponding plate, with said height being such that the liquid column in a given tube can adjust itself to compensate for variations in gas pressure difference between above and below a corresponding plate; and

f. a plurality of gas shut-off means cooperating with the portions of a corresponding one of said run-off means located in the space below in a corresponding plate, each gas shut-off means including a porous, sintered material having a plurality of parallel passage openings of predetermined cross-sectional area therethrough, said latter material positioned in a corresponding tube such that the sum of the capillary pressure of the liquid in the latter passage openings and the hydrostatic pressure of the liquid column in the tube above it exert said greater

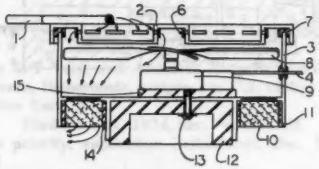
pressure on the gas below the corresponding plate to thereby prevent said gases or vapors from passing from the space below said corresponding plate to the space above through a given gas shut-off means and its corresponding run-off means.

3,958,965

ASH TRAY WITH SMOKE FILTER

Mark B. Raczkowski, 741 Manhattan Ave., Brooklyn, N.Y. 11206

Filed Sept. 29, 1975, Ser. No. 617,934
Int. Cl.² B01D *46/00*
U.S. Cl. 55—385 G **1 Claim**



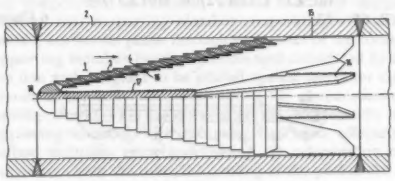
1. An ash tray unit, containing:
an ash tray having a center bridge with several side vents, said ash tray having a flame and ash arrestors,
a housing having a perforated ring on the bottom, said housing having a compartment for the smoke filter at the bottom, said housing having smoke seals in lower part,
a fan means mounted in said housing,
a seal between the ash tray and the housing,
an easy to change smoke filter,
an anti vibration support.

3,958,966

SEPARATOR MEMBER FOR SEPARATING SOLIDS FROM GASEOUS MEDIA

Herbert Keller, Mulheim, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Oct. 18, 1974, Ser. No. 515,826
Claims priority, application Germany, Oct. 18, 1973, 2352335
Int. Cl.² B01D *45/04*
U.S. Cl. 55—442 **7 Claims**



1. Cone-shaped separator-body having a tip and a foot for separating solids from a gaseous medium comprising a substantially hollow elongated member comprising a plurality of annular separator elements disposed concentrically behind each other in longitudinal axial direction of said elongated member and each having an outer and an inner peripheral surface, the diameter of each separator element in the direction from the tip to the foot of said coneshaped separator-body increasing from element to element, the cross section of each separator element being shaped substantially as an obtuse triangle having a base-side lying parallel to the axis of said elongated member and coextensive with the width of one of the peripheral surfaces of each separator element, and two other sides starting from said base-side and pointing generally in said longitudinal axial direction, one of the two other sides of each of two mutually adjacent separator elements defining therebetween a gradually enlarging flow channel extending in a direction continuously varying from being transverse to said longitudinal axial direction to being substantially parallel thereto, and a gap at the entrance of said flow channel between two adjacent separator elements whereby the solids are separated from the gaseous medium.

3,958,967

MOTOCYCLE SPARK ARRESTOR

David S. Nakamura, Garden Grove, Calif., assignor to Bassani Manufacturing, Anaheim, Calif.

Filed Aug. 2, 1974, Ser. No. 494,220
Int. Cl.² B01D *39/10*
U.S. Cl. 55—490 **6 Claims**

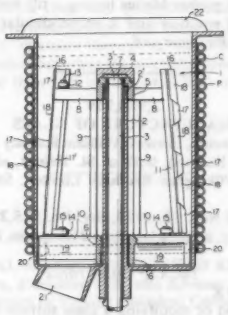
1. A spark arrestor for use with an exhaust pipe comprising:
an elongate housing connectable to said exhaust pipe; and
a screen connected in said housing, said screen including a planar, rectangular, central section positioned parallel to the longitudinal axis of said housing and contacting the opposite sides thereof, and first and second planar end sections made integral with the opposite ends of said central section and extending in opposite directions therefrom at obtuse angles thereto of at least 100°, the free ends of said end sections contacting and being connected to said housing.

3,958,968

ICE CREAM FREEZER

Yoshisada Hosaka, 13-14, Matsugaya 2, Taitoh, Tokyo, Japan

Filed Mar. 28, 1974, Ser. No. 455,550
Int. Cl.² A23G *9/12*
U.S. Cl. 62—343 **6 Claims**



1. An ice cream freezer comprising:
a refrigerated cylindrical container supported within a housing and opened at its upper end,
said container having an integrally formed hollow cylinder extending upright through the central portion of its bottom wall up to near its open end, and having between said hollow cylinder and its inner wall a product outlet com-

municating to and opening at a side wall portion of said housing; and

a revolving blade positioned within said container,

said blade assembly including a rotating shaft inserted through the hollow cylinder and having a top and extending beyond the upper end of the cylinder, an upper hub rotatably supported at an upper end portion of the cylinder and drivingly connected with the top end of said rotating shaft, said upper hub having a threadably engageable closing cap and a pair of horizontally extending arms; a lower hub surrounding the hollow cylinder near the bottom of the container and connected to said horizontal arms through vertical stays, said lower hub having horizontally extending pusher blades; and a pair of scraper blades supported between the outer ends of said horizontal arms and the outer ends of said pusher blades and inclined toward the direction of rotation with respect to the generating line of said cylindrical container and frictionally engaging the inner wall surface of the container, each of said scraper blades having land portions and groove portions alternately formed at its outer surface, each groove portion having narrower and broader widths at its leading and trailing edges respectively.

5. An ice cream freezer comprising:

a refrigerated cylindrical container supported within a housing and opened at its upper end,

said container having an integrally formed hollow cylinder extending upright through the central portion of its bottom wall up to near its open upper end, and having between said hollow cylinder and its inner wall a product outlet communicating to and opening at a side wall portion of said housing; and

a revolving blade assembly positioned within said container;

said blade assembly including a rotating shaft inserted through the hollow cylinder and having a top and extending beyond the upper end of the cylinder, an upper hub rotatably supported at an upper end portion of the cylinder and drivingly connected with the top end of said rotating shaft, said upper hub having a threadably engageable closing cap and a pair of horizontally extending arms; a lower hub surrounding the hollow cylinder near the bottom of the container and connected to said horizontal arms through vertical stays, said lower hub having horizontally extending pusher blades; and a pair of scraper blades supported between the outer ends of said horizontal arms and the outer ends of said pusher blades inclined toward the direction of rotation with respect to the generating line of said cylindrical container and frictionally engaging the inner wall surface of the container, each of said pusher blades having a tilt wall tilted in the direction of rotation and a perpendicular triangle wall provided at its outer end.

3,958,969

MANUFACTURE OF GLASS

David Gordon Loukes, Prescot; William Ramsey Maltman, and Colin Robert Howard, both of St. Helens, all of England, assignors to Pilkington Brothers Limited, St. Helens, England

Filed Nov. 19, 1974, Ser. No. 525,279

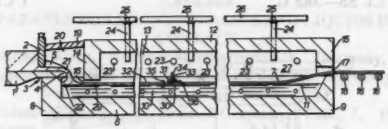
Claims priority, application United Kingdom, Nov. 23, 1973, 54497/73

Int. Cl.² C03B *18/02*

U.S. Cl. 65—30 E **25 Claims**

1. In a method of modifying a glass surface in which glass is contacted with a molten metal body while the glass is at a temperature at which it is susceptible to surface modification, relative movement is effected between the molten metal body and the glass, and migration of cations from the molten metal body into the glass surface is electrically induced, the improvement comprising periodically during said migration connecting said molten metal body as a cathode with respect to the glass for a preset time by the transmission of cathodic pulses of preset duration to the molten metal body, and regulating the quantity of electricity passing in each cathodic pulse to a value sufficient at least partially to de-oxidise the molten metal body.

20. Apparatus for manufacturing glass with a modified surface comprising an electrically conductive contact for one surface of the glass, electrode means for maintaining a body of molten metal in contact with the other surface of the glass,



an electrical supply source connected to said contact and to said electrode means through a switchable supply circuit, and a control waveform generator connected to said switchable supply circuit and including settable means operable to cause the generator to produce a control waveform consisting of a sequence of switching pulses for application to the switching circuit to control the switching of a sequence of anodic and cathodic current pulses to the electrode means to effect the required modification of the glass surface.

3,958,970

METHOD OF CASTING FLUORESCENT LENSES

Francois E. Auzel, 39 avenue Port-Royal des champs, Le Mesnil Saint-Denis, France

Division of Ser. No. 275,435, July 26, 1972, Pat. No. 3,816,576, which is a division of Ser. No. 113,317, Feb. 8, 1971, Pat. No. 3,709,827. This application Mar. 29, 1974, Ser. No. 456,155

Claims priority, application France, Feb. 10, 1970, 70.04606

Int. Cl.² C03B *32/00*; H01J *31/49*

U.S. Cl. 65—33 **6 Claims**

1. A method for preparing fluorescent material for optical conversion of near infrared from 0.85 to 1.06 millimicrons into visible radiation comprising the steps of:

a. mixing at room temperature finely divided solid fluorides of lead, magnesium, beryllium, as vitrifying agents with yetterbium fluoride, which has devitrifying properties and with a powdered doping agent selected from the group consisting of erbium fluoride for red and green at a concentration of 6×10^{20} to 24×10^{20} atoms per cm^3 and thulium fluoride for blue in a concentration of 1.5×10^{20} atoms per cm^3, the weight percentages being

lead fluoride	20 – 45%
beryllium fluoride	20 – 40%
magnesium fluoride	5 – 20%
ytterbium fluoride	balance to 100%

except for doping amounts;

b. heating the mixture to about 1200°C to convert the mixture to the molten state in a time period of up to about 6 minutes;

c. cooling the molten mixture at ambient or room temperature from 1200°C to about 500°C in a still molten condition; and

d. casting the cooled molten mixture in a mold to provide the solidified material in predetermined envelope form.

3,958,971

METHOD OF MANUFACTURING A TUBULAR LAMP ENVELOPE

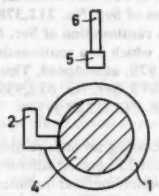
Jan Man in'T Veld, and Adrianus Antonius Hurx, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 21, 1974, Ser. No. 525,935

Claims priority, application Netherlands, Dec. 13, 1973, 7317073

Int. Cl.² C03B *23/06, 23/08*

U.S. Cl. 65—108 **2 Claims**



1. A method of manufacturing a torus-shaped lamp envelope which comprises softening a straight tube by heating, bending said tube in a vertical plane around a bending mould, cooling the tube to a temperature at which deformation of the shape of the torus as a result of gravity does not occur, supporting the tube at an instant between the instant at which the bending operation is completed and the instant at which the said temperature is reached, with at least one supporting member, said supporting member cooperating with the tube above a horizontal plane through the center of the torus, said supporting member being a suction tool connected to a suction line and designed to be placed against the outer circumference of the bent tube, interrupting the cooperation of the bending mould with the tube after the cooperation of the supporting member with the tube has been effected said method including prior to effecting the cooperation of the suction tool with the tube, the cooling of the part of the outer circumference of the tube disposed opposite to the suction tool by means of a cooling gas which is blown on the tube via the suction tool.

2. A device for manufacturing a torus-shaped lamp envelope which is particularly suitable for a fluorescent lamp, which device comprises a bending mould as well as means to bend a straight tube around said bending mould, which device furthermore comprises at least one supporting member for supporting the torus-shaped tube and movable with respect to the bent tube, characterized in that the supporting member is in the form of suction tool which can be connected to a suction line and which is designed to cooperate with the outer wall of the bent tube, said suction tool being selectively placed in fluid connection with a supply line for a cooling gas which can be closed.

3,958,972

CHELATES OF 1,2-DIAMINOCYCLOHEXANE TETRAKIS (METHYLENE PHOSPHONIC ACID) USEFUL FOR SUPPLYING NUTRIENT METALS TO PLANTS GROWING IN CALCAREOUS SOIL

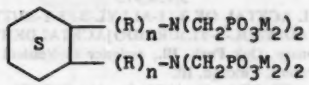
Ralph W. Magin, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed July 5, 1974, Ser. No. 486,270

Int. Cl.² C05C *11/00*; C07F *1/08, 1/00*

U.S. Cl. 71—27 **13 Claims**

1. A method of treating plants which comprises contacting the plant or the soil in which the plant is growing with an effective amount of a chelate of a polyvalent metal and a compound having the formula



wherein M is hydrogen, alkali metal, ammonium or amine, R is C_{1-6} alkylene or alkylidene and *n* is 0 or 1.

3,958,973

MICRONUTRIENT METAL-CONTAINING PHOSPHATE GLASSES

Gordon J. Roberts, Shaker Heights, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Division of Ser. No. 407,530, Oct. 18, 1973, Pat. No. 3,930,833. This application Oct. 1, 1975, Ser. No. 618,517

Int. Cl.² C05G *3/00*; C03C *3/16*

U.S. Cl. 71—64 G **15 Claims**

1. A glass composition adapted in comminuted form to act as a micronutrient in both acidic and alkaline soils consisting essentially of a nonoxidizing phosphate base glass containing a nutrient amount of a micronutrient metal oxide to nourish plant and seed growth in such acidic or alkaline soils, said micronutrient metal oxide being selected from the group consisting of the oxides of copper, manganese, molybdenum, boron, and mixtures thereof, and a sufficient amount of a metal control agent to control the water solubility of said glass composition and provide a water-extraction of said micronutrient metal oxide from said phosphate base glass at a rate within a predetermined range, said metal control agent being R_2O or RCl or mixtures thereof, in which R is potassium or sodium, provided that when the micronutrient metal is manganese, no more than 50% by weight of R_2O or RCl is Na_2O or NaCl.

3,958,974

HERBICIDAL N-ARYL SUBSTITUTED AZETIDINONES

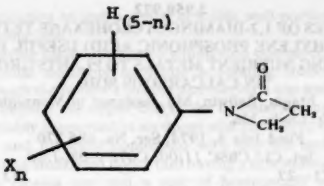
Roger D. Hotz, Evanston, and John Krenzer, Oak Park, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Dec. 20, 1974, Ser. No. 534,596

Int. Cl.² A01N *9/22*

U.S. Cl. 71—88 **8 Claims**

1. A method of controlling weeds which comprises contacting the weeds with a herbicidal composition comprising an inert carrier and as an essential active ingredient in a quantity toxic to weeds a compound of the formula



wherein X is selected from the group consisting of lower alkyl, lower alkenyl, lower alkoxy, lower alkylthio, halogen, lower haloalkyl and nitro; and n is an integer from 0 to 5.

3,958,975

DIETHYL ACETAL OF 2-[1-ALLYL-3-(5-T-BUTYL-1,3,4-THIADIAZOL-2-YL)UREIDO]ACETALDEHYDE

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Feb. 18, 1975, Ser. No. 545,650

Int. Cl.² C07D *285/12*; **A01N** *9/12*, *13/00*

U.S. Cl. 71—90 **3 Claims**

1. The compound the diethyl acetal of 2-[1-allyl-3-(5-t-butyl-1,3,4-thiadiazol-2-yl)ureido]acetaldehyde.

3,958,976

2-ARYL-5,6,7,8-TETRAHYDROIMIDAZO[1,5A]-PYRIDINE-1,3(2H,8AH)-DIONES AS HERBICIDES

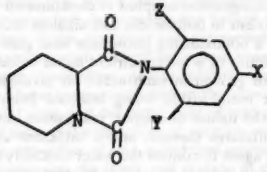
Steven Jerome Goddard, West Grove, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 3, 1975, Ser. No. 546,698

Int. Cl.² C07D *471/04*

U.S. Cl. 71—92 **9 Claims**

1. A compound of the formula



wherein

Z is hydrogen or fluorine, and Y is hydrogen or fluorine, X is bromine, chlorine or fluorine, provided that when Y and Z are both fluorine, X must also be fluorine.

3,958,977

HERBICIDAL COMPOSITION

David J. Prochaska, Seneca, S.C.; Eldon S. Ratcliffe, Cottage Grove, Minn., and Donald W. Gates, Monroe, La., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 16, 1974, Ser. No. 532,770

Int. Cl.³ A01N *9/16*

U.S. Cl. 71—103 **7 Claims**

1. A herbicidal composition characterized by containing, in effective amounts, an admixture of one part by weight of 5-acetamido-2,4-dimethyltrifluoromethanesulfonanilide or a horticulturally acceptable salt thereof with from about 1 to 2 parts by weight of 3-[p-(p-chlorophenoxy) phenyl]-1,1-dimethylurea as the active components.

3,958,978

PROCESS FOR COPPER METAL ORE REDUCTION

Paul Franklin Taylor, P.O. Box 468, Crossville, Tenn. 38555

Continuation-in-part of Ser. No. 403,261, Oct. 3, 1973, Pat. No. 3,833,353, which is a continuation-in-part of Ser. No. 273,284, July 19, 1972, abandoned. This application Sept. 3, 1974, Ser. No. 502,896

Int. Cl.² C21B *3/04*

U.S. Cl. 75—21 **7 Claims**

1. A method of reducing cuprite metal ore oxides, malachite, azurite, and chalcopyrite, or mixtures thereof comprising the steps of: (a) Admixing finely divided ores selected from the group consisting of cuprite, malachite, azurite, and chalcopyrite to a liquid chemical solution consisting essentially of about 24.2 parts by weight of phosphoric acid, about 0.5 parts by weight of zinc oxide, and about 1.0 part by weight of a sulfated surfactant, (b) stirring to aid chemical reaction and maintain mixture homogeneity, (c) heating mixture to vaporize the volatile materials until residue is baked to a dry solid state, and (d) heating residue sufficiently so as to (smelt) melt out copper, iron, gold, silver, and members of the platinum group, or mixtures thereof.

3,958,979

METALLURGICAL PROCESS FOR PURIFYING ALUMINUM-SILICON ALLOY

Alex R. Vaido, Phoenix, Ariz., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 424,842, Dec. 14, 1973, which is a continuation of Ser. No. 212,378, Dec. 27, 1971, abandoned, which is a continuation of Ser. No. 32,326, April 27, 1970, abandoned, which is a continuation-in-part of Ser. No. 26,751, April 8, 1970, abandoned. This application Sept. 12, 1975, Ser. No. 612,939

Int. Cl.² C22B *21/06*

U.S. Cl. 75—63 **2 Claims**

1. A method of processing an impure aluminum base alloy containing at least about 23 percent silicon and at least about 1.6 percent titanium, which method includes the step of melting the alloy and stirring the molten alloy with at least half its weight of a molten fluoride flux less dense than the alloy and having a boiling point above the alloy's liquidus temperature, then permitting the stirred mixture to stand to settle out a molten alloy in which the titanium content is reduced but not entirely eliminated, and separating the settled out alloy from the flux.

3,958,980

PROCESS FOR REMOVING ALKALI-METAL IMPURITIES FROM MOLTEN ALUMINUM

Andrew Geza Szekely, Yorktown Heights, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 8, 1974, Ser. No. 522,143

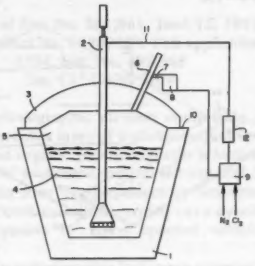
Int. Cl.² C22B *21/06*

U.S. Cl. 75—68 R **8 Claims**

1. A method of removing alkali metal impurities from aluminum while substantially avoiding the emission of environmentally harmful gases and fumes comprising the steps of:

1. providing a vessel for treating molten aluminum, said vessel being provided with inlet means for introducing gas into the molten aluminum and gas outlet means for withdrawal of the effluent gas from the vessel,
2. introducing molten aluminum essentially free from alloying constituents prior to the addition of any alloying constituents thereto into said vessel,
3. introducing a sparging gas comprising a mixture of a gas selected from the group consisting of chlorine, fluorine, halogen-containing compounds and mixtures thereof, and a gas inert with respect to aluminum into the molten bath in the form of discrete well-distributed gas bubbles so that said gas bubbles come into intimate contact with substantially the entire mass of molten aluminum in said metal bath,

4. maintaining the concentration of halogen in said sparging gas at a value such that as the concentration of alkali metal impurities in the melt is progressively reduced the selective halogenation of said impurities relative to aluminum at any given level of alkali metal impurity is sufficiently high to restrict the concentration of aluminum halide in the effluent gas below a predetermined permissible limit, and



5. maintaining the flow of said sparging gas into said molten aluminum for a period of time sufficient to lower the concentration of alkali metal impurities in said aluminum to the desired level whereby said alkali metal impurities are removed as halides at a sufficiently high utilization of the halogens and halogen-containing compounds such that the effluent gas contains substantially no unreacted fluorine or chlorine and its concentration of aluminum halide is below the predetermined permissible limit.

3,958,981
PROCESS FOR DEGASSING ALUMINUM AND ALUMINUM ALLOYS

Helge O. Forberg, Owensboro, Ky.; Henry E. Chia, Carrollton, and Paul S. Keith, Atlanta, both of Ga., assignors to Southwire Company, Carrollton, Ga. and National Steel Corporation, Pittsburgh, Pa.

Filed Apr. 16, 1975, Ser. No. 568,810
Int. Cl.² C22B *21/06*
U.S. Cl. 75—68 R **13 Claims**

1. A process for degassing aluminum and aluminum alloys which comprises passing through the molten metal a gaseous mixture consisting essentially of fluorine, hydrofluoric acid, carbon monoxide and carbon dioxide.

3,958,982
ALUMINUM EXTRACTION PROCESS

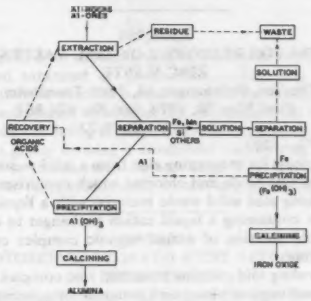
Wen H. Huang, 803 Attache Court, Tampa, Fla. 33601

Filed Dec. 12, 1974, Ser. No. 532,166
Int. Cl.² C22B *21/00*
U.S. Cl. 75—101 R **8 Claims**

1. A process for the extraction and recovery of aluminum from aluminum-containing raw materials, said process comprising:

a. extracting aluminum-containing raw materials with a reagent selected from the group consisting of fruit juices and complexing organic acids at temperatures up to 150° C. for a predetermined period of time to form a solution containing an aluminum-organo complex;

b. separating said solution from the resultant residue; and



c. recovering the aluminum in the form of alumina from said aluminum-organo complex.

3,958,983
DECOMPOSITION OF CHALCOPYRITE

Walter Lyman Staker, Salt Lake City, Utah, assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed June 19, 1975, Ser. No. 588,547
Int. Cl.² C22B *15/00*, *61/00*
U.S. Cl. 75—101 R **6 Claims**

1. A process for decomposition of chalcopyrite ore or concentrate comprising reacting the ore or concentrate with an aqueous acid solution of a transition metal ion in a lower valence state, said metal being from the group consisting of chromium, vanadium and titanium.

3,958,984
METHOD OF REMOVING A BRAZING ALLOY FROM STAINLESS STEEL

Laurence R. Fountain, 33 Brice Road, West Springfield, Mass. 01089

Filed Mar. 18, 1974, Ser. No. 452,454
Int. Cl.² C22B *3/00*
U.S. Cl. 75—105 **5 Claims**

1. A method of removing a high temperature brazing alloy from stainless steel wherein said brazing alloy contains a major amount of a metal selected from the group consisting of gold, silver and nickel, said method comprising treating said brazing alloy with an aqueous solution of an alkali cyanide and a nitro-substituted aromatic compound at a temperature of about 160° to 180°F, rinsing said brazing alloy in water and treating said brazing alloy in an acid solution containing 40% to 50% by volume nitric acid at a temperature of about 100° to 120°F.

3,958,985
EXTRACTION METHOD FOR NON-FERROUS METALS

Steven Jon Anderson, 3988 S. 1460 West, Salt Lake City, Utah 84107, assignor to Chemsep Corporation, Salt Lake City, Utah

Filed Feb. 7, 1975, Ser. No. 547,780
Int. Cl.² C22B *15/00*
U.S. Cl. 75—117 **36 Claims**

1. A process for treating mineral deposits to convert the non-ferrous metals contained therein to a recoverable form which comprises

a. mixing a finely divided mineral deposit with an aqueous solution of an inorganic acid to form a slurry wherein the stoichiometric ratio of inorganic acid to non-ferrous metal is at least 1.5 to 1,

b. heating said slurry to dryness and baking under quiescent conditions at a temperature of about 350° C. to 800° C. and for a period of time sufficient to convert said non-ferrous metals into recoverable metal salts.

3,958,986
PROCESS FOR RECOVERY OF ZINC VALUES FROM ZINC WASTE

Gunnar Thorsen, Steinhaugen 41, 7000 Trondheim, Norway

Filed May 30, 1974, Ser. No. 474,851
Int. Cl.² C22B 19/22
U.S. Cl. 75—120 **6 Claims**

1. A process for recovering zinc from a solid waste material containing zinc oxide and chlorine which comprises:

a. leaching said solid waste material with a liquid organic phase containing a liquid cation exchanger to obtain an organic solution of a zinc organic complex containing chlorine;

b. separating said chlorine from said zinc complex by washing said organic phase with water or an aqueous alkaline solution; and

c. contacting said organic phase with an aqueous solution of a mineral acid to obtain a precipitation of a zinc salt or an aqueous solution of said zinc salt.

3,958,987
ALUMINUM IRON COBALT SILICON ALLOY AND METHOD OF PREPARATION THEREOF

E. Henry Chia; Frank M. Powers, and Kenneth E. Chadwick, all of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

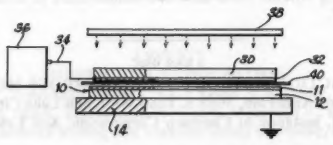
Filed Mar. 17, 1975, Ser. No. 559,112
Int. Cl.² C22C 21/02
U.S. Cl. 75—148 **9 Claims**

1. A heat resistant aluminum alloy consisting essentially of from about 0.48 to about 0.88 weight percent silicon, from about 0.30 to about 1.30 weight percent iron, from about 0.20 to about 1.60 weight percent cobalt and the balance of aluminum containing trace elements selected from the group consisting of copper, manganese, magnesium, titanium, vanadium and zinc wherein individual concentrations of said trace elements do not exceed 0.05 weight percent and the total concentration of said trace elements does not exceed 0.15 weight percent.

3,958,988
PHOTOCONDUCTORS HAVING IMPROVED SENSITIVITY BY PRESENCE OF A LIKE POLAR FIELDS DURING IMAGING

William E. Bixby, Deerfield, Ill., assignor to A. B. Dick Company, Niles, Ill.

Filed Feb. 19, 1974, Ser. No. 443,501
Int. Cl.² G03G 13/02, 15/00
U.S. Cl. 96—1 C **14 Claims**

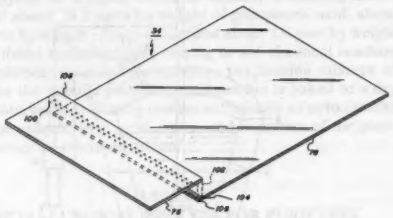


1. In the method of development of an electrostatic image on a photoconductive surface provided with an overall electrostatic charge of a predetermined polarity, by exposing the charged surface to an image pattern of light and shadow for dissipation of electrostatic charge in the light exposed areas, the improvement comprising positioning an electrode closely adjacent the charged surface, imposing an electrical potential on the electrode of the same polarity as that of the charge on the charged surface while the charged surface is being exposed to the image pattern of light.

3,958,989
TRANSPARENCY SUPPORT MATERIAL FOR ELECTROPHOTOGRAPHIC PROCESS

William E. Kramer, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 367,608, June 6, 1973. This application Aug. 8, 1974, Ser. No. 495,698
Int. Cl.² G03G 5/12
U.S. Cl. 96—1.2 **4 Claims**



1. A method of creating multi-color transparencies by an electrophotographic printing process, including the steps of forming a image receiving sheet from a substantially transparent, non-fibrous material, said material having high sliding friction between successive sheets:

overlapping the leading marginal region of an image receiving sheet with the trailing marginal region of a fibrous sheet;

securing adhesively the image receiving sheet to the fibrous sheet in the overlapped region such that the fibrous sheet extends over a portion of the image receiving sheet in an outwadly direction therefrom;

charging a photoconductive surface to a substantially uniform potential;

projecting a filtered light image onto the charged photoconductive surface to record thereon an electrostatic latent image corresponding to a single color of the original document;

depositing a toner powder, complementary in color to the filtered light image, on the electrostatic latent image in image configuration;

transferring the toner powder image from the elctrostatic latent image recorded on the photoconductive surface to the image receiving sheet;

repeating said steps of charging, projecting, depositing, and transferring for at least one other color of the original document;

fixing the multi-layered toner powder images substantially permanently to the image receiving sheet; and

separating the fibrous sheet from the image receiving sheet after said step of fixing.

3,958,990
TRANSFERRING TONER TO AN AMINE COATED SHEET

Richard A. Parent, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 465,965, May 1, 1974. This application Apr. 17, 1975, Ser. No. 569,137
Int. Cl.² G03G 13/16, 13/22
U.S. Cl. 96—1.4 **6 Claims**

1. A method of xerographically preparing a color transparency copy comprising:

a. forming a single color powder image of a multicolored original to be reproduced;

b. transferring the powder image to a transparency comprising a thermoplastic film sheet, said sheet having at least

one surface coated with a nonvolatile aliphatic amine, the amine coating having a thickness of above 0.1 mil; and

c. fixing the powder image on the transparency.

3,958,991
SUPERSENSITIZING DYE COMBINATION FOR ELECTROPHOTOGRAPHIC COMPOSITION AND ELEMENT

Jean Elmore Jones, and William Edward Yoerger, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 261,881, June 12, 1972, now Defensive Publication No. T0909009. This application Aug. 7, 1974, Ser. No. 495,365

Int. Cl.² G03G *5/09*

U.S. Cl. 96—1.6 **8 Claims**

3. An electrophotographic element comprising a support having coated thereon a layer of a photoconductive composition comprising an organic photoconductor selected from the group consisting of arylamine, polyarylalkane and diarylamino-substituted chalcone photoconductors sensitized with a supersensitizing combination comprising (a) a cyanine, merocyanine, rhodacyanine or styryl spectral sensitizing dye wherein said dye

1. has an anodic polarographic half-wave potential less than +1.0 volts;
2. has an anodic polarographic half-wave potential and a cathodic polarographic half-wave potential which, when added together, give a sum more negative than −0.10 volts; and
3. desensitizes negative silver bromoiodide emulsions, containing 99.35 mole percent bromide, less than 0.4 log E at radiation of 365 nm. when incorporated therein at a concentration of 0.2 millimole of dye per mole of silver halide; and (b) as a supersensitizer therefore, an electron accepting pyrylium or thiapyrylium dye salt.

3,958,992
1,3-DISULFONYLCYCLOALKANES AS SILVER HALIDE SOLVENTS

Richard B. Greenwald, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 23, 1974, Ser. No. 535,205

Int. Cl.² G03C *5/54, 5/38*

U.S. Cl. 96—29 R **23 Claims**

1. A photographic processing composition comprising an aqueous alkaline processing solution of a silver halide developing agent and 1,3-disulfonylcycloalkane dissolved therein as a silver halide solvent, said 1,3-disulfonylcycloalkane possessing 6, 7, or 8 members in in the cyclic ring and substituted in the 2-position with at least one hydrogen atom.

3,958,993
DEVELOPMENT INHIBITOR-RELEASING TYPE COMPOUND FOR PHOTOGRAPHIC USE

Mitsuto Fujiwhara; Takaya Endo; Ryosuke Satoh; Toyoaki Masukawa, and Satoshi Nakagawa, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

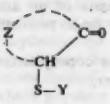
Filed Nov. 23, 1973, Ser. No. 418,589

Claims priority, application Japan, Nov. 29, 1972, 47-118892

Int. Cl.² G03C *5/30*

U.S. Cl. 96—66.3 **4 Claims**

1. A method for development of an imagewise exposed silver halide photosensitive material which comprises developing said material in the presence of a development inhibitor-releasing compound of the formula:



wherein Z is an atomic group necessary to form a 5 to 7 membered saturated or unsaturated carbon ring with the carbon atoms to which it is attached, said ring being unsubstituted or substituted by at least one of halogen and a member of the class consisting of alkyl, aryl, alkoxy, acyloxy, aryloxy, SY and a group forming a condensed carbon ring with said saturated or unsaturated carbon ring; Y is arylmercapto, heterocylic, thioglycollic acid, cystein and glutathione.

3,958,994
PHOTOSENSITIVE DIAZO STEEL LITHOPLATE STRUCTURE

Leo S. Burnett, Summit, N.J., assignor to American Hoechst Corporation, Bridgewater, N.J.

Filed Aug. 26, 1974, Ser. No. 500,570

Int. Cl.² G03F *7/08;* **G03C** *1/94, 1/52*

U.S. Cl. 96—75 **3 Claims**

1. A lithographic printing plate structure, comprising a support sheet of steel, normally subject to corrosion in a lithographic environment,

a metallurgically bonded coating of aluminum-zinc alloy in which the alloy comprises about 25 to 70% aluminum and about 75 to 30% zinc, on at least one side of said sheet of steel, said coating having a thickness in the range of about 0.5 to 3 mils,

a coating of a polyvinyl phosphonic acid directly on said coating,

and, directly on said polyvinyl phosphonic acid coating, a photosensitive layer comprising a diazo compound which upon exposure to actinic light provides photo-hardened areas in the exposed areas of the layer, whereby upon development of the layer with a solvent only the unexposed areas are removed.

3,958,995
PHOTOGRAPHIC ELEMENTS CONTAINING CROSS-LINKED MORDANTS AND PROCESSES OF PREPARING SAID ELEMENTS

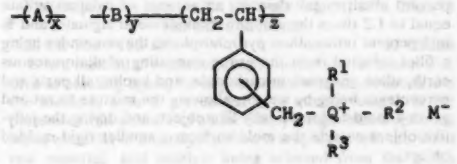
Gerald A. Campbell; Hyman Cohen, and Lewis R. Hamilton, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 19, 1974, Ser. No. 525,248

Int. Cl.² G03C *1/40*

U.S. Cl. 96—84 A **50 Claims**

1. A dye mordant composition containing a water-dispersible polymer comprising units according to the formula:



wherein A represents units of an addition polymerizable monomer containing at least two ethenically unsaturated groups;

B represents units of a copolymerizable α,β-ethylenically unsaturated monomer;

Q is N or P;

R^1, R^2 and R^3 are independently selected from the group consisting of carbocyclic and alkyl groups;

M^- is an anion;

x is from about 0.25 to about 5 mole percent;

y is from about 0 to about 90 mole percent; and

z is from about 10 to about 99 mole percent.

3,958,996

PHOTOPOLYMERIZABLE PASTE COMPOSITION

Harold Kirkwood Inskip, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 7, 1973, Ser. No. 357,525

Int. Cl. G03c 1/68

U.S. Cl. 96—115 P **12 Claims**

1. A photopolymerizable paste composition comprising

about 20 to about 80 percent, by weight, of finely divided inorganic particulate material,

about 0.5 to about 5 percent, by weight, of at least one photopolymerizable monomer,

about 0.01 to about 2 percent, by weight, of an organic sensitizer,

about 1 to about 15 percent, by weight, of a polymeric binder having an inherent viscosity, in chloroform at 25°C, in the range of 1 to 2, and

about 10 to about 75 percent, by weight, of a substantially saturated hydrogenated solvent containing 10 to 40 carbon atoms formed by the hydrogenation of a terpenoid solvent.

3,958,997

METHOD OF SHAKER MOLDING AND COMPOSITION THEREFOR

Allen A. Greenberg, 9149 Peachblossom Court, Cincinnati, Ohio 45231

Filed July 21, 1971, Ser. No. 164,740

Int. Cl.² C08L 5/04

U.S. Cl. 106—38.5 R **8 Claims**

1. A method of forming a molded object which comprises mixing together approximately 6 parts of water and one part of a molding powder consisting essentially of from 7 to 15 percent alkali metal alginate, an amount of calcium sulfate equal to 1.2 times the amount of alkali metal alginate, and ¾ to 3 percent tetrasodium pyrophosphate, the remainder being a filler selected from the group consisting of diatomaceous earth, silica, magnesium carbonate, and kaolin, all parts and percentages being by weight, allowing the mixture to set and gel in a mold to form a jelly-like object, and drying the jelly-like object outside the mold to form a smaller rigid molded object.

3,958,998

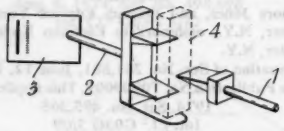
HOT TOP LINING SLABS AND SLEEVES

Robert Edwin Atterbury, Handsworth, England, assignor to Foseco Trading A.G., Switzerland

Continuation of Ser. No. 260,360, June 7, 1972, abandoned. This application Sept. 12, 1974, Ser. No. 505,388

Int. Cl.² B28B 7/36

U.S. Cl. 106—38.22 **14 Claims**



1. A hot top lining slab or sleeve which comprises a refractory, deformable, self-supporting, substantially uniform fibrous mat having in its dry condition a flexibility such that the material deforms by 0.7 cm. without total fracture under a load not exceeding 20 Kg., a restitution of not more than 30%, a droop value of not more than 17 cm, a compressibility value of 0.1 to 1.6 Kg./cm.², and an extensibility value not exceeding 50 Kg.

3,958,999

OPTICAL GLASS

Tetsuro Izumitani, Hino, and Hiroji Sagara, Tokyo, both of Japan, assignors to Hoya Glass Works, Ltd., Tokyo, Japan

Continuation of Ser. No. 274,381, July 24, 1972, abandoned. This application Jan. 3, 1975, Ser. No. 538,483

Claims priority, application Japan, July 30, 1971, 46-57246; Sept. 16, 1971, 46-71981

Int. Cl.² C03C 3/04, 3/10, 3/08, 3/00

U.S. Cl. 106—47 Q **12 Claims**

1. A thorium oxide-free glass having a liquidus temperature not greater than 1085°C and having optical constants of 1.62–1.91 for n_d and 59–27 for νd consisting essentially of a composition in weight percent of 18 to 60% B_2O_3 + SiO_2, a quantity of B_2O_3 being present and the content of said SiO_2 being 0 to 23%, 0 to 50% La_2O_3, 2to 50% Gd_2O_3, 2 to 30% Ta_2O_5, 0 to 50% ZnO, 0 to 53% CdO, 0 to 60% PbO, 0 to 50% BaO, 0 to 45% SrO, 0 to 30% CaO, 0 to 20% MgO, the sum of said ZnO + CdO + PbO + BaO + SrO + CaO + MgO being 2 to 60%, 0 to 16% Al_2O_3, 0 to 9% ZrO_2, 0 to 10% TiO_2, 0 to 26% Nb_2O_5, 0 to 15% WO_3, and 0 to 18% Y_2O_3.

3,959,000

HIGH STRENGTH GLASS MADE BY ION EXCHANGE

Kenji Nakagawa, and Ko Itaya, both of Tokorozawa, Japan, assignors to Hoya Glass Works, Tokyo, Japan

Division of Ser. No. 269,873, July 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 20,176, March 17, 1970, abandoned. This application Apr. 30, 1974, Ser. No. 465,547

Claims priority, application Japan, Mar. 27, 1969, 44-23342

Int. Cl.² C03C 3/04, 15/00

U.S. Cl. 106—52 **7 Claims**

1. In a process for producing a high strength glass comprising the steps of:

a. providing a glass from a composition consisting essentially, on the oxide basis by mol%, of:

47.8 to 76.6 SiO_2, 4.4–14.9 Al_2O_3, 4.1 – 12.1 Na_2O, 9 – 16.1 Li_2O, 0 – 6% ZnO and 0 – 6.9% MgO;

b. contacting the glass of step (a) at a temperature of about the glass strain point or less with an alkali metal salt having a larger ionic radius alkali ion than that in said glass composition to affect ion exchange,

the improvement of reducing the contacting time of step (b) to a period of about 10 – 30 minutes while at the same

time improving the compressive strength of the resulting treated product without divitrification, comprising introducing into glass composition (a) from 2 – 7.8 F_2, such that the sum of $SiO_2 + Al_2O_3 + Na_2O + Li_2O + ZnO + Mgo + F_2$ is at least 90%, thus producing a high strength glass having a compressive surface layer of 21 – 67 microns in thickness and a bending strength between about 4,380 and 10,800 kg/cm².

3,959,001
METHOD OF PREPARING AN ELECTRICALLY INSULATING EMBEDDING COMPOSITION

Helmut Clasen, Niederkassel-Ranzel, and Klaus Deneke, Troisdorf-Spich, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Dec. 17, 1974, Ser. No. 533,737

Claims priority, application Germany, Dec. 21, 1973, 2363790

Int. Cl.² C04B *35/04*

U.S. Cl. 106—60 **7 Claims**

1. A thermally conductive refractory electrical insulating embedding composition comprising granular magnesium oxide and granular fused magnesium iron alumino silicate said magnesium iron alumino silicate being present in said composition in an amount of 0.5 to 4% based on the weight of said magnesium oxide, said magnesium iron alumino silicate having a composition as follows:

silica	40 to 75
alumina	15 to 35
MgO	5 to 25
FeO	5 to 20

3,959,002
METHOD OF MANUFACTURING WHITE FURNACE BOATS FOR FIRING CERAMIC ARTICLES AND NOVEL FURNACE BOATS

Friedrich J. Esper, Leonberg, Germany, assignor to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany

Filed May 2, 1974, Ser. No. 466,299

Claims priority, application Germany, May 10, 1973, 2323486

Int. Cl.² C04B *35/18, 35/10*

U.S. Cl. 106—65 **9 Claims**

1. A method for manufacturing iron-free refractory ceramic articles comprising

admixing until a homogeneous mixture is obtained

a. between 45% and 55% of synthetic corundum having a particle size of between 1 and 2 mm;

b. between 25% and 35% of synthetic corundum having a particle size of from between 0.1 and 0.2 mm;

c. between 5% and 20% of kaolin having a particle size of 99.9% under 0.06 mm and 0.1% over 0.06 mm; and

d. between 5% and 10% of quartz having a particle size of between 0.1 and 2 mm;

and then firing said homogeneous mixture at an elevated temperature to form a white furnace boat.

3,959,003
THIXOTROPIC CEMENTING COMPOSITIONS

Gabriel W. Ostroot, and Jiten Chatterji, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 242,738, April 10, 1972. This application July 20, 1973, Ser. No. 381,296

Int. Cl.² C04B *7/353*

U.S. Cl. 106—93 **25 Claims**

4. A thixotropic cement slurry having a relatively high viscosity under quiescent conditions and low viscosity under turbulent conditions, comprising a mixture of water, hydraulic cement and a thixotropic agent formed by complexing a polyvalent metal salt selected from the group consisting of zirconium, lead, chromium, ferric iron, hafnium, lanthanum and yttrium and a water soluble cellulose ether selected from the group consisting of hydroxyethyl cellulose, carboxymethyl cellulose, carboxyethyl cellulose, hydroxyethyl carboxymethyl cellulose or combinations thereof.

20. An additive which provides thixotropic properties of relatively high viscosity under quiescent conditions and low viscosity under turbulent conditions comprising a complex of a polyvalent metal selected from zirconium, lead, chromium, ferric iron, hafnium, lanthanum and yttrium complexed under alkaline cement conditions with a water soluble cellulose ether selected from hydroxyalkyl cellulose, carboxyalkyl cellulose ethers, mixed ethers and combinations thereof.

24. A thixotropic cement slurry having a relatively high viscosity under quiescent conditions and low viscosity under turbulent conditions, comprising a mixture of water, hydraulic cement and a thixotropic agent formed by complexing a polyvalent metal salt selected from the group consisting of zirconium, lead, chromium, ferric iron, hafnium, lanthanum and yttrium and a water soluble hydroxyethyl cellulose.

25. A thixotropic cement slurry having a relatively high viscosity under quiescent conditions and low viscosity under turbulent conditions comprising a mixture of water, hydraulic cement and a thixotropic agent formed by complexing zirconyl chloride and a water soluble cellulose ether selected from the group consisting of hydroxyethyl cellulose, carboxymethyl cellulose, carboxyethyl cellulose, hydroxyethyl carboxymethyl cellulose or combinations thereof.

3,959,004
PROCESS FOR PRODUCING LOW POROSITY CEMENT

Lynden J. Stryker, Mt. Pleasant, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Apr. 21, 1975, Ser. No. 570,014

Int. Cl.² C04B *7/35, 7/353*

U.S. Cl. 106—93 **10 Claims**

1. A method of making a gypsum-free, low porosity free-flowing cement paste which consists essentially of the following mixing sequence;

a. combining hydraulic cement without gypsum ground to a fineness of from 3,500 to 9,000 cm.²/gram with from 0.1% to about 1.0% of alkali or alkaline earch lignosulfonate or sulfonated lignin,

b. combining 20% to 40% of water with 0.1% to 2.0% of an alkali bicarbonate, and

c. thereafter mixing together the combined materials of steps (a) and (b), all percentages based on dry weight of ground cement.

5. A method of making a gypsum-free, low porosity, free-flowing cement paste which consists essentially of;

a. admixing from 0.1% to about 1.0% of alkali or alkaline earth lignosulfonate or sulfonated lignin, from 0.1% to about 2.0% of an alkali bicarbonate with 20% to 40% of water, all percentages based on the dry weight of ground cement, and then

b. mixing the materials of step (a) with hydraulic cement without gypsum ground to a Blaine fineness of from 3,500 to 9,000 cm.²/gm.

3,959,005
METHOD FOR MANUFACTURING WOOD MATERIAL BOARDS

Henrik Bruun, and Heikki Savikko, both of Abo Akademi, Turku, Finland

Filed Aug. 19, 1974, Ser. No. 498,724

Claims priority, application Finland, Aug. 21, 1973, 2603/73

Int. Cl.² C08L *1/02*

U.S. Cl. 106—163 R **13 Claims**

1. In a method of manufacture of wood material boards with urea as bonding agent, the improvement wherein to accelerate the method, urea is prereacted in a mixing reactor in the presence from about 1 to about 3% by weight based upon the wood material of a catalyst before it is sprayed into the wood raw material, said catalyst being selected from the group

consisting of (a) water soluble salt of a non-precious metal, (b) water soluble mono- or disaccahride, (c) organic amine, and (d) a solution of (a), (b) or (c), and thereafter the activated resultant reaction mixture of urea is introduced into the wood based raw material and the material pressed into boards at a temperature of 180° to 250°C.

3,959,006

SINGLE CRYSTAL ON THE BASIS OF GALLIUM GARNET

Jorg Herrnring, Hamburg; Wolfgang Tolksdorf, Tornesch; Christian Rusche, Hamburg; Dieter Mateika, Ellerbek; Gerhard Winkler, Hamburg, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 16, 1975, Ser. No. 613,855
Int. Cl.² C04b *35/50*
U.S. Cl. 106—42 **2 Claims**

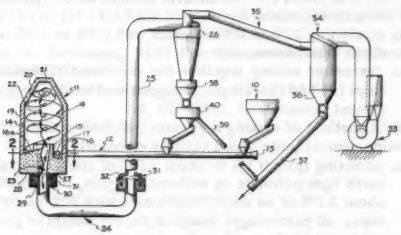
1. A single crystal on the basis of rare earth gallium garnet, characterized in that the garnet corresponds to the composition $A_{3-x}^{3+}B_x^{2+}Ga_{5-x}^{3+}C_x^{4+}O_{12}$, wherein
A = gadolinium, samarium or neodymium,
B = calcium, strontium or magnesium,
C = zirconium or tin and $0.2 \leqq x \leqq 0.8$.

3,959,007

PROCESS FOR THE PREPARATION OF SILICEOUS ASHES

Norman Pitt, Los Angeles, Calif., assignor to Structural Materials, Los Angeles, Calif.

Division of Ser. No. 276,134, July 28, 1972, abandoned. This application Oct. 19, 1973, Ser. No. 407,907
Int. Cl.³ C09C *1/28*; F23C *5/18*
U.S. Cl. 106—288 B **3 Claims**



1. A process for the incineration of siliceous organic plant material containing up to about 28% of SiO_2 which comprises tangentially introducing said material in an atmosphere of hot oxidizing gas, said gas being at combustion or incineration conditions, into a furnace having a circular cross section and a closed top, thereby causing said material to travel in an ascending helical path toward said closed top near the outer periphery of said furnace and thereby initiating an exothermic reaction and allowing said material to reach a temperature not in excess of 1300°F, but lower than the gas mass temperature of said furnace, whereupon the direction of flow reverses, causing said material to descend in said furnace in a generally helical path internal to said ascending helical path, and withdrawing all combustion products, amorphous product material, and combustion supporting gases from the bottom of said furnace.

3,959,008

CARBON BLACK

Amos C. Warner, and Chalmes V. Williams, both of Monroe, La., assignors to Cities Service Company, Tulsa, Okla.

Filed June 24, 1974, Ser. No. 482,127
Int. Cl.³ C09C *1/48*
U.S. Cl. 106—307 **21 Claims**

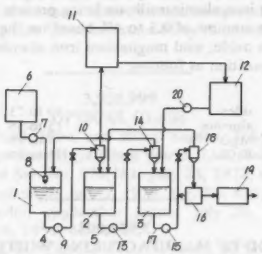
1. An oxygenated furnace carbon black having a particle size of at least 15 millimicrons, a dibutylphthalate absorption value not exceeding 120 c.c./100 gms, a nitrogen surface area of at least 450 m^2/gm., and an oxygen content of at least 4 weight percent.

3,959,009

METHOD FOR CONTINUOUSLY PURIFYING PULLULAN

Koso Kato, and Tatsuo Nomura, both of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsukagaku Kenkyujo, Okayama, Japan

Filed Feb. 14, 1975, Ser. No. 550,028
Claims priority, application Japan, Feb. 23, 1974, 49-21783
Int. Cl.² C12D *13/04*; C13L *3/00*
U.S. Cl. 127—34 **4 Claims**



1. A continuous method for the purification of pullulan using a series of at least two liquids, each liquid comprising a solution in water of organic solvent incapable of dissolving pullulan, wherein the concentration of said organic solvent in each of said liquids is higher than the minimum necessary to precipitate pullulan and said concentration increases in each successive liquid in said series, comprising:

introducing an aqueous pullulan solution into the first of said series of liquids to precipitate pullulan particles in the liquid and form a mixture in which pullulan particles are suspended;

separating the pullulan particle suspension from the mixture in each liquid of said series which contains such a mixture, except for the last liquid of said series;

transferring each pullulan particle suspension separated from the liquid in said separating step into the liquid in said series immediately succeeding that liquid from which each pullulan particle suspension being separated comes, whereby the pullulan particles are dehydrated and purified; and

recovering the dehydrated pullulan in powder form from the last liquid of said series.

3,959,010

VORTEX CLEANER AND METHOD OF CLEANING

David L. Thompson, Long Beach, and Edward E. Headrick, La Canada, both of Calif., assignors to Thompson Tank Manufacturing Company, Long Beach, Calif.

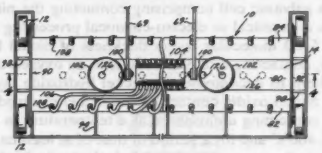
Filed Sept. 30, 1974, Ser. No. 510,579
Int. Cl.³ B08B *5/04*
U.S. Cl. 134—21 **20 Claims**

1. A method for the removal of finely subdivided debris and foreign material from pavement and the like which comprises:

passing an open ended tubular member bearing inlet aperture means in its undersurface over the surface of said pavement;

developing a vacuum of at least about three inches mercury below atmospheric pressure in said member by removing air therefrom at a volumetric flow rate of at least about 200 standard cubic feet per minute per square inch of area of said aperture means to generate a well defined vortex in the air stream entering said member;

positioning the tubular member over said surface at a distance of from 0.5 to about 5 inches to locate the base of said vortex on the surface of said pavement and thereby entrain said debris and foreign material in said air stream.



8. A vacuum cleaning unit which comprises:

a tubular cleaning head;

a plurality of circular air intake apertures positioned along the undersurface of said tubular head;

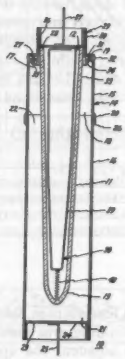
means connecting said spray nozzles to a pressured supply of water; and

vacuum means connecting said header to air pump means having a capacity of at least about 200 standard cubic feet per minute per square inch of total flow area of said apertures at a subatmospheric pressure of at least 3 inches mercury below atmospheric pressure.

3,959,011
BATTERY CASING

Roy F. Thornton, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 4, 1974, Ser. No. 512,149
Int. Cl.² H01M *2/02*
U.S. Cl. 136—6 FS **1 Claim**

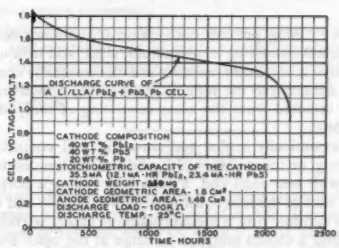


1. A battery casing comprising an inner casing of a solid sodium ion-conductive material with one open end, an outer metallic casing comprising an upper portion and a lower portion, the upper portion with opposite open ends, an inwardly extending flange affixed to the upper portion at its first open end, the lower portion with opposite open ends, a removable closure for its first open end, and an opening in the removable closed end, the upper and lower portions joined together at their associated second open ends, the outer metallic casing surrounding the inner casing with the exterior surface of the flange on a lower plane than the surface of the open end of the inner casing and spaced from the inner casing, a metallic closure consisting of a cap portion with a flange and a cap insert, the flange of the cap portion positioned adjacent the flange of the upper portion of the outer metallic casing, a first glass seal sealing together the adjacent flanges of the upper portion of the outer metallic casing and of the cap portion of the metallic closure and sealing the adjacent flanges to the outer wall of the inner casing adjacent its open end, a second glass seal sealing together the opposite surface of the flange of the upper portion of the outer metallic casing and a portion of the outer wall of the inner casing, the cap insert adapted to be positioned within the cap portion thereby closing the open end of the inner casing, and an electronic conductor affixed to the interior surface of the cap insert adapted to be positioned within the interior surface of the inner casing, the electronic conductor in the form of a closed wire hairpin, and a wire spiral affixed to one end of the wire hairpin and in contact with interior surface of the closed end of the inner casing.

3,959,012
COMPOSITE CATHODE MATERIALS FOR SOLID STATE BATTERIES

C. C. Liang, Andover, and L. H. Barnette, West Medford, both of Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Apr. 25, 1974, Ser. No. 464,071
Int. Cl.² H01M *35/02, 43/00*
U.S. Cl. 136—6 L **17 Claims**



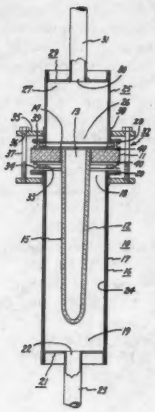
1. A solid state cell comprising an anode; a solid electrolyte; and a cathode comprising as cathode-active material a mixture of a metal halide and at least one metal chalcogenide, said metal halide being selected from the bromides and iodides of metals of the group consisting of lead, silver, copper, antimony, mercury, arsenic, bismuth, chromium, iron, cobalt, nickel, molybdenum and tin, said metal chalcogenide selected from the group consisting of the sulfides, selenides and tellurides of said metals.

13. A cathode-active material comprising a mixture of a metal halide and at least one metal chalcogenide, said metal of the metal halide being selected from the group consisting of Pb, Ag, Cu, Sb, As, Hg, Bi, Mo, Sn, Ni, Cr, Fe, and Co; and said metal of said metal chalcogenide also selected from said group; said halide being selected from the bromides and iodides of said metals; and said chalcogenides being selected from the sulfides, selenides and tellurides of said metals.

3,959,013
CATHODE CELL CASING PORTION, A CELL CASING, AND A HERMETICALLY SEALED SODIUM-SULFUR CELL

Manfred W. Breiter, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed June 11, 1975, Ser. No. 586,048
Int. Cl.² H01M 10/00
U.S. Cl. 136—6 FS 4 Claims



1. A cell casing portion comprising a container selected from the class consisting of aluminum, steel, and iron-nickel-cobalt alloys, a corrosion resistant and electronically conducting layer adhering to the inner surface of the container, and the layer selected from the class consisting of molybdenum and graphite.

4. A hermetically sealed sodium-sulfur cell comprising a ceramic ring, an inner casing of a solid sodium ion-conductive material with one open end, a glass seal sealing a portion of the outer wall of the inner casing adjacent its open end within and to the ceramic ring, a metallic cathode casing portion with an open and a closed end and a flange at the open end, the cathode casing portion selected from the class consisting of aluminum, steel, and iron-nickel-cobalt alloys, a corrosion resistant and electronically conducting layer adhering to the inner surface of the cathode casing portion, the layer selected from the class consisting of molybdenum and graphite, the cathode casing portion surrounding the inner casing and spaced therefrom, the flange of the cathode casing portion adjacent the ceramic ring, a metallic anode casing portion with an open and a closed end and a flange at the open end positioned with the flange adjacent the ceramic ring whereby the anode casing portion is spaced from and extends in an opposite direction to the cathode casing portion, the anode casing portion selected from the same metal as the cathode casing portion, and means for joining the cathode and anode portions to the ceramic ring thereby forming a continuous outer cell casing, a sodium negative electrode in the inner casing and in the anode casing portion, and a positive electrode in the cathode casing portion surrounding the inner casing and contacting the outer wall of the inner casing and the inner wall of the cathode casing portion, the positive electrode comprising sulfur in electrically conductive material.

3,959,014
METHOD TO PRODUCE A PROTECTIVE OXIDE ON THE SURFACE OF POSITIVE NICKEL ELECTRODES FOR GALVANIC CELLS

Martin Bauer; Henning Ewe, both of Braunschweig, and Eduard Justi, Schapen, all of Germany, assignors to Varta Batterie Aktiengesellschaft and Siemen AG, Kelkheim, Taunus, Germany, part interest to each

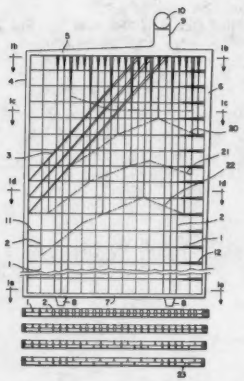
Filed Dec. 14, 1972, Ser. No. 315,219
Claims priority, application Germany, Dec. 14, 1971, 2161898
Int. Cl.² H01M 35/18
U.S. Cl. 136—29 4 Claims

1. The method for the production of a thin protective layer of nickel oxide on the surface of a porous nickel electrode for use in a galvanic cell comprising contacting the nickel electrode to a chemical or electro-chemical processing to form a film of 5–30 molecular layers thickness of nickel hydroxide thereon, contacting said electrode with an oxygen containing atmosphere to decompose the nickel hydroxide layer to the desired nickel oxide, contacting the nickel electrode with an oxygen containing atmosphere at a temperature in the range of 160°–400°C and for a period of time of at least half an hour and thereafter recovering a nickel electrode having a thin protective film of nickel oxide on the surface thereof.

3,959,015
PLATE GRID FOR LEAD STORAGE BATTERIES

Jürgen Brinkmann, Hagen; Gerwin Trippe, Gevelsberg, and Willi Heissman, Nachrodt, all of Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

Filed Oct. 18, 1974, Ser. No. 516,122
Claims priority, application Germany, Dec. 21, 1973, 2363759
Int. Cl.² H01M 4/72
U.S. Cl. 136—37 14 Claims



1. A grid plate for a lead storage battery including generally parallel, vertically extending grid rods and a current take-off connector positioned adjacent the upper ends of said rods, and characterized in that at least some of said rods have the portions farthest from the take-off connector formed as half rods and the portions closest to the connector as whole rods.

11. A grid plate for a lead storage battery including generally parallel, vertically extending grid rods, and characterized in that at least some of said rods are formed partly as half rods located on only one side of a plane parallel to the grid surface and partly as whole rods located on both sides of said plane.

3,959,016

METHOD FOR MANUFACTURING LEAD GRID PLATES FOR BATTERIES

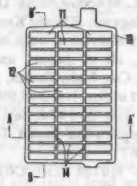
Naokatsu Tsuda, Tokyo, Japan, assignor to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Dec. 24, 1974, Ser. No. 536,222

Claims priority, application Japan, Dec. 26, 1973, 49-2182; Dec. 29, 1973, 49-4082; Jan. 31, 1974, 49-13132; Jan. 31, 1974, 49-13133; Jan. 31, 1974, 49-13134; Nov. 1, 1974, 49-126316

Int. Cl.² H01M 4/82

U.S. Cl. 136—67 2 Claims



1. A method for manufacturing a lead grid plate having an outer frame portion for batteries comprising the first step of preparing a rolled lead alloy plate measuring 0.5 to 1 mm in thickness; and the second step of press punching the rolled lead alloy plate by means of a metal mold to obtain a lead grid plate, the width of the grid forming members of the plate measuring about the same as the thickness of the plate, said second step being accomplished in at least two steps by press punching only voids at least in every alternate file or row or in a zig-zag line, then filling the lead grid plate with active material.

3,959,017

ELECTRODE AND SPACER ASSEMBLY FOR A FUEL CELL AND FUEL CELL THEREWITH

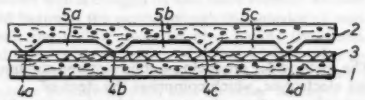
Gerhard Louis, Hofheim, and Harald Böhm, Glashutten, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Aug. 29, 1973, Ser. No. 392,520

Claims priority, application Germany, Sept. 1, 1972, 2243211

Int. Cl.² H01M 8/02, 2/18

U.S. Cl. 136—86 D 9 Claims



1. An electrode and spacer assembly for a fuel cell comprising a porous polymer cemented thin layer electrode sheet and porous, electrically insulating, mutually spaced strips bonded onto a face of the sheet, said strips serving as protrusions and forming channels for the free flow of electrolyte.

3,959,018

LOW PRESSURE NICKEL HYDROGEN CELL

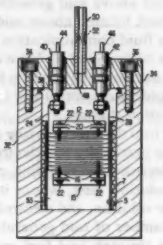
James D. Dunlop, Gaithersburg; Martin William Earl, Adelphi, both of Md., and Gerrit Van Ommering, Washington, D.C., assignors to Communications Satellite Corporation, Washington, D.C.

Continuation-in-part of Ser. No. 309,837, Nov. 27, 1972, Pat. No. 3,850,694. This application Sept. 16, 1974, Ser. No. 506,086

The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.

Int. Cl.² H01M 4/32, 10/00

U.S. Cl. 136—86 S 9 Claims



1. An improved rechargeable power cell of the type that comprises a sealed container, said container including therein a first electrode means comprising an oxidizing agent, a second electrode means comprising a catalyst mounted on a conductive support, said catalyst being a material capable of dissociating molecular hydrogen to monatomic hydrogen, an alkaline electrolyte, electrolyte retaining means disposed between said first electrode means and said second electrode means and a supply of hydrogen in said container wherein the improvement comprises:

a hexagonal rare earth intermetallic hydride disposed within said container out of contact with said electrolyte, said intermetallic hydride being a material capable of absorbing and desorbing hydrogen in response to changes in pressure.

3,959,019

FUEL CELL

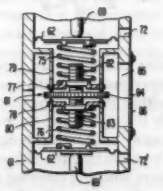
Noriomi Miyoshi, and Yukimasa Tachibana, both of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Division of Ser. No. 456,993, April 1, 1974, abandoned. This application June 11, 1975, Ser. No. 585,894

Claims priority, application Japan, Mar. 30, 1973, 48-36531

Int. Cl.² H01M 8/04

U.S. Cl. 136—86 R 2 Claims



1. In a fuel cell comprising:

1. a generator cell having a fuel gas chamber, an oxidizing gas chamber, and an electrolyzing solution chamber;

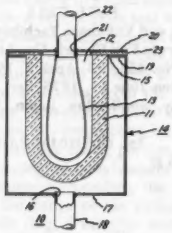
2. a fuel gas circulating circuit for supplying fuel gas to the fuel gas chamber of said generator cell;
3. an oxidizing gas circulating circuit for supplying oxidizing gas to the oxidizing gas chamber of said generator cell;
4. an electrolyte circulating circuit for supplying an electrolytic solution to the electrolyzing solution chamber of said generator cell;
5. a gas cooler located in said fuel gas circulating circuit beneath said generator cell;
6. a formed water tank located beneath said gas cooler and in fluid communication therewith, whereby moisture formed in said generating cell, carried by said fuel gas into said gas cooler, and condensed therein will drip by force of gravity into said formed water tank;
7. an electrolyzing solution tank located in said electrolyte circulating circuit above said generator cell; and
8. a clean water tank located above said electrolyzing solution tank and in fluid communication therewith, whereby clean water can be supplied by force of gravity from time to time to said electrolyzing solution tank from said clean water tank in order to control the concentration of the electrolytic solution therein,

whereby gas leaked into the electrolyzing solution chamber of said generator cell is carried by the electrolytic solution flowing through said electrolyte circulating circuit upwards into said electrolyzing solution tank, where it is easily separated from the electrolytic solution, and electrolytic solution leaked into the fuel gas chamber of said generator cell is carried by the fuel gas flowing through said fuel gas circulating circuit downwards into said gas cooler, where it is separated from the fuel gas and dripped into said formed water tank, the improvement comprising means for keeping the fuel gas pressure in the fuel gas chamber of said generator cell and the oxidizing gas pressure in the oxidizing gas chamber of said generator cell constant and equal.

3,959,020
BATTERY CASING AND SEALED PRIMARY SODIUM-HALOGEN BATTERY

Fritz G. Will, Scotia, N.Y., and Heinrich J. Hess, Nidau, Switzerland, assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 230,864, March 1, 1972, abandoned. This application Aug. 19, 1974, Ser. No. 498,264
Int. Cl.² H01M 8/10
U.S. Cl. 136—86 A **9 Claims**



1. A battery casing comprises an inner casing of a solid sodium ion-conductive material with one open end, an electronic conductor within the interior of the inner casing and extending outwardly through the open end of the inner casing, an outer metallic casing with an open end and an opening in the outer casing, a metallic fill tube affixed to the outer casing and in communication with the opening and with the interior of the outer casing, an inwardly extending flange affixed to the outer metallic casing at its open end, the outer metallic casing surrounding the inner casing with the exterior surface of the flange on the same plane with the surface of the open end of the inner casing and spaced from the inner casing, a cover having a centrally disposed opening therein, a metallic fill tube sealed to the cover and communicating with the opening therein and with the interior of the inner vessel, the cover closing the open ends of the outer metallic casing and of the inner casing, a low temperature melting glass in contact with the exterior surface of the flange of the outer metallic casing, in contact with the surface at the open end of the inner casing, and in contact with a portion of the interior surface of the cover, the low temperature glass sealing the cover to the exterior surface of the flange of the outer metallic casing and to the surface at the open end of the inner casing, and the electronic conductor within the inner casing and extending outwardly through the open end of the inner casing affixed to the fill tube sealed to the cover.

3,959,021
NOVEL MANGANESE DIOXIDE

Atsushi Nishino, Neyagawa; Hiroshi Kumano, Daito; Yoshinori Noguchi; Kazunori Sonetaka, both of Kadoma, and Yasuji Amano, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

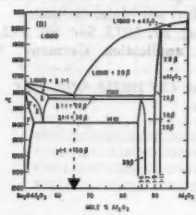
Continuation-in-part of Ser. No. 208,993, Dec. 16, 1971. This application Jan. 3, 1974, Ser. No. 430,521
Claims priority, application Japan, Dec. 29, 1969, 45-766; Dec. 29, 1969, 45-767
Int. Cl.² H01M 4/50; C01G 45/02
U.S. Cl. 136—138 **2 Claims**

1. A composition of γ_T-manganese dioxide of the formula γ_T-MnO_x having a peak indicating an index of plane (110) of ramsdellite in its X-ray diffraction pattern at 28° with a strong intensity, x in MnO_x is 1.970 – 1.990 and it contains 94 – 98.5% of an effective oxygen and 0.05 – 0.3% by weight of chlorine in the form of chlorine ion and containing 1–4% by weight of B-MnO_2.

3,959,022
METHOD FOR PRODUCING SODIUM-BETA-ALUMINA SOLID ELECTROLYTES

Lutgard C. DeJonghe, and Harish Chandan, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed July 9, 1975, Ser. No. 594,549
Int. Cl.² H01M 6/04; C04B 35/44
U.S. Cl. 136—153 **13 Claims**



1. The method for producing a solid sintered sodium-beta-alumina electrolyte, which comprises the steps of

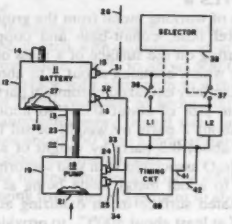
a. preparing a sodium-aluminum oxide mixture in which the atom ratio of sodium to aluminum is 0.54;
b. mixing 100 parts, by weight, of sodium-beta-alumina powder with about 5 to 10 parts, by weight, of the sodium-aluminum oxide mixture; and
c. heating the resulting mixture to a reactive liquid phase sintering temperature of from between 1600° to 1700° C. for a sufficient time to produce a solid sintered body.

3,959,023

FLUSHING PUMP FOR SEA WATER BATTERIES

Ivan La Garde, Chelmsford, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed June 23, 1975, Ser. No. 589,500
Int. Cl.[2] H01M 2/38
U.S. Cl. 136—160 14 Claims



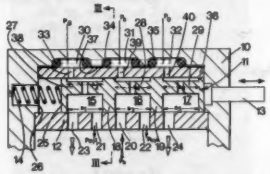
1. A power supply system, comprising, a sea water battery including a housing formed to define an electrolyte inlet and an electrolyte outlet and a pump hydraulically connected for pumping sea water into said inlet, characterized in that said system includes a light electrical load and a heavy electrical load, means for selectively energizing said loads from said battery, and means for actuating said pump concurrently with the energization of said heavy load, whereby, upon such actuation, sea water enters said battery through said inlet and is expelled through said outlet.

3,959,024

SLIDE VALVE

Colin John Kirk, and Malcolm John Searle, both of Twickenham, England, assignors to Martonair Limited, Twickenham, England

Filed Aug. 22, 1974, Ser. No. 499,477
Claims priority, application United Kingdom, Sept. 29, 1973, 45639/73
Int. Cl.[2] F15B 13/04
U.S. Cl. 137—625.25 2 Claims



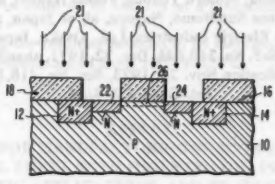
1. A slide valve comprising a hollow valve member, a housing containing the valve member and having a ported wall against which the valve member is slidable between operative positions, in each of which a different combination of ports in said ported wall is bridged by said valve member to effect flow of fluid between the ports through the interior of said valve member, the hollow valve member having transverse walls spaced apart in the direction of sliding of said valve member and dividing the interior of said valve member into a plurality of separate chambers, each said chamber having a partition therein extending in the direction of sliding of said valve member at a position therein spaced transversely of the valve member from said ported wall of said housing, each said internal partition having an aperture therein and a surface on each side of said internal partition of substantially equal area, whereby fluid pressure within the relevant chamber in said valve member is transmitted through said aperture in said internal partition and acts on each surface of said internal partition to hold said valve member in substantial fluid balance in a direction perpendicular to said ported wall and thereby to reduce the force required to slide said valve member between its operative positions, said housing having a further wall facing said ported wall and having therein a plurality of cavities communicating with the interior of said housing, the number of said cavities being equal to the number of chambers in said valve member, sealing means bounding the periphery of each said cavity, and a bearing plate positioned between the valve member and said further wall, said bearing plate having ports therein effecting communication through the internal partitions in said valve member between the chambers therein and the sealed cavities in said further wall, said valve member slidable between said bearing plate and ported wall.

3,959,025

METHOD OF MAKING AN INSULATED GATE FIELD EFFECT TRANSISTOR

Murray Arthur Polinsky, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 1, 1974, Ser. No. 465,892
Int. Cl.[2] H01L 21/265
U.S. Cl. 148—1.5 10 Claims



1. In a method of making an insulated gate field effect transistor wherein a mask is formed on a surface of a semiconductor substrate of one type conductivity and ions of an opposite type conductivity modifier are implanted beneath portions of said surface exposed by said mask whereby spaced source and drain regions of said opposite type conductivity or extensions thereof are formed while leaving a channel region between said source and drain regions, the improvement in said method comprising the steps of:

forming windows in a first layer of material on said surface with said windows exposing said portions of said surface whereby said mask is formed,

bombarding said surface with said ions,

heating said substrate to a temperature at which said ions will diffuse into said substrate, and maintaining said substrate at said temperature until a desired redistribution of said ions is achieved,

forming a second layer of insulating material different from the material of said first layer on said surface exposed by said mask,

removing said first layer from said surface whereby said surface overlying said channel region is exposed,

forming a gate dielectric, comprising one or more layers of insulating material and being thinner than said second layer, on said surface overlying said channel region, and

forming a gate electrode member on said gate dielectric whereby the effective gate length is registered with the length of said gate dielectric.

3,959,026

METHOD OF PREPARATION OF A SEMICONDUCTING TERNARY ALLOY FROM THE SEMICONDUCTING COMPOUND ZNTE BY ION

Jean Marine, Grenoble, and Huguette Rodot, Meudon-Bellevue, both of France, assignors to Commissariat a l'Energie atomique, Grenoble and Agence Nationale de Valorisation de la Recherche (ANVAR), Meudon-Bellevue, both of France

Filed Sept. 11, 1974, Ser. No. 504,955

Claims priority, application France, Sept. 11, 1973, 73.32643

Int. Cl.[2] H01L *21/265*

U.S. Cl. 148—1.5 13 Claims

1. A method of preparation of a semiconducting ternary structure starting with a binary semiconductor having the formula ZnTe, wherein said method comprises: subjecting a wafer of said semiconductor to at least one bombardment with a flux of magnesium ions, the energy and the density of the bombardment or bombardments being such that a desired concentration of magnesium ions is obtained in the portion of said semiconductor to be droped by displacement of Zn Ions and then thermally annealing the doped semiconductor, the concentration of magnesium being such as to obtain an alloy having the formula $Mg_XZn_{1-X}Te$ with $O<X<1$.

3,959,027

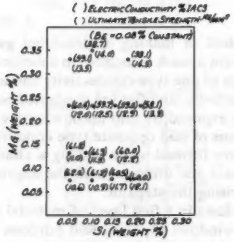
METHOD OF MANUFACTURING ALUMINUM ALLOY ELECTRIC CONDUCTORS

Yoshio Matsuda; Minoru Yokota; Yoshie Hanaki, all of Osaka, and Megumu Sumitomo, Nagoya, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 210,646, Dec. 22, 1971, abandoned. This application Nov. 23, 1973, Ser. No. 418,188

Int. Cl.[2] C22F *1/04*

U.S. Cl. 148—2 1 Claim



1. The method of manufacturing an aluminum alloy electric conductor comprising the steps of mixing an alloy consisting essentially of approximately 0.05–0.25 wt-% magnesium, 0.05–0.25 wt-% silicon, 0.0005–0.3 wt-% beryllium, with a balance of aluminum under the additional conditions that the magnesium and silicon content satisfy the relationship of $Mg + Si \leq 0.30$ wt-%, melting the mixture, casting the melted mixture, hot rolling the metal casting, cold drawing the rolled casting into an electric conductor, and applying a continuous annealing treatment to the cold drawn conductor.

3,959,028

PROCESS OF WORKING METALS COATED WITH A PROTECTIVE COATING

Raymond Pennoyer Jackson, Suffern, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 307,862, Nov. 20, 1972, Pat. No. 3,861,938. This application Nov. 8, 1974, Ser. No. 522,030

Int. Cl.[2] C21D *7/13*; C22F *1/08, 1/10*

U.S. Cl. 148—11.5 R 3 Claims

1. A process of working metal from the group consisting of iron-base, nickel base, cobalt-base and copper-base alloys comprising coating on the surface of a mass of said metal an aqueous slurry which contains about 5 to about 10 parts by weight of substantially equiaxed chromium particles having an average particle size of about 0.001 to about 25 microns, about 0.4 to about 2 parts by weight of sol form silica and about 0.02 to about 0.3 parts by weight of alkali metal ion measured as Me_2O associated with said sol form silica with the ratio of silica to alkali metal oxide being at least about 4, heating the coated surface in an oxidizing atmosphere at a temperature of at least about 800°C., to provide a continuous, gas impermeable, film thereon, soaking said film coated metal mass in air at a temperature below the melting point of said metal to bring said metal mass to working temperature and, thereafter, working said metal to provide a worked metal object substantially devoid of products of oxidation of its metal on the surface thereof and substantially devoid of any skin depleted or enriched in alloy content through solid-gas reaction.

3,959,029

PROCESS OF MAKING COLD REDUCED Al-STABILIZED STEEL HAVING HIGH DRAWABILITY

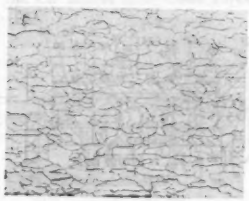
Kazuo Matsudo, and Takayoshi Shimomura, both of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 200,559, Nov. 11, 1971, abandoned. This application Feb. 4, 1974, Ser. No. 439,601

Claims priority, application Japan, Nov. 21, 1970, 46-103164

Int. Cl.[2] C21D *9/48*

U.S. Cl. 148—12 C 8 Claims



1. Process of making Al-stabilized steel having high drawability, comprising the steps of

A. making steel consisting essentially of 0.03% to 0.15% C, 0.02% to 0.07% Sol.Al., and other elements and in quantities contained in ordinary Al-Stabilized steel;

B. hot rolling said steel at a finishing temperature of more than the Ar_3 point, and at a coiling temperature of less than about 600°C;

C. first cold reducing said steel at a reduction rate of more than 30%;

D. first annealing said cold reduced steel at about 780°C wherein said C content is decarburized to less than about 0.01%;

E. second cold reducing said annealed steel at a reduction rate of more than 30%; and

F. annealing said steel by a recrystallized softening annealing thereby to produce a steel having an $\bar{r}$ value of about 2.2 to 2.3.

3,959,030

METHOD OF PRODUCING ALUMINUM COATED STEEL

Jiro Satake, Ibaraki; Saburo Nagata, Kobe, and Katsuyasu Kawasaki, Takatsuki, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Japan

Filed Dec. 30, 1974, Ser. No. 537,327

Int. Cl.² C21D 7/14; B05D 1/02

U.S. Cl. 148—12 R **8 Claims**

1. A method for preparing aluminum coated steel comprising the steps of

heating and thereafter maintaining a surface of a steel substrate to be coated with aluminum at at a temperature ranging from about 100°C to about 500°C,

spraying the surface with aluminum in a thickness ranging from about 30 micrometers to about 300 micrometers,

heating the aluminum spray coated steel to a temperature ranging from about 150°C to a temperature at which alloy formation may be initiated, and

hot-rolling the heated aluminum coated steel to a reduction in area ranging from about 5 percent to about 80 percent.

3,959,031

MOLTEN BASIC WELDING FLUXES LOW IN MANGANESE AND WITH LOW MOISTURE SENSITIVITY

Anton More, Burghausen, Germany, assignor to Wacker-Chemie GmbH, Munich, Germany

Filed Dec. 23, 1974, Ser. No. 535,381

Claims priority, application Germany, Dec. 28, 1973, 2365058; Jan. 3, 1974, 2400183

Int. Cl.² B23K 35/34; C22B 9/10

U.S. Cl. 148—26 **8 Claims**

1. Molten basic welding fluxes low in manganese with low moisture sensitivity consisting essentially of the following components:

10	–	18% by weight of SiO_2
15	–	25% by weight of Al_2O_3
0.1	–	2.0% by weight of at least one member of the group consisting of FeO and Fe_2O_3
0	–	8% by weight of TiO_2
0	–	3% by weight of MnO
1	–	8% by weight of CaO
0	–	4% by weight of BaO
16	–	33% by weight of MgO
0	–	2% by weight of at least one member of the group consisting of Na_2O and K_2O
0	–	8% by weight of ZrO_2
15	–	28% by weight of CaF_2
0	–	1% by weight of Cr_2O_3
1	–	8% by weight of CaO + BaO
25	–	37% by weight of CaO + BaO + MgO
12	–	22% by weight of SiO_2 + TiO_2.

3,959,032

MAGNETIC MATERIALS WITH EXCHANGE ANISOTROPY AND PROCESS FOR THEIR MANUFACTURE

Eberhard Koester, Frankenthal; Gerd Wunsch, Speyer; Paul Deigner, Weisenheim; Dieter Graw, Ludwigshafen; Karl Uhl, Frankenthal, and Werner Steck, Mutterstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Dec. 23, 1974, Ser. No. 535,577

Claims priority, application Germany, Dec. 29, 1973, 2365179

Int. Cl.² H01F 1/33

U.S. Cl. 148—105 **3 Claims**

2. A process for the manufacture of magnetic pigments showing exchange anisotropy, essentially consisting of two-phase magnetic single domain particles with the alloy

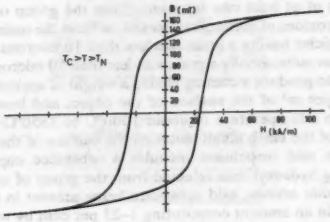
$[Co_xNi_{1-x}]$

as the ferromagnetic phase A and its oxidized form

$[(CoO)_x(NiO)_{1-x}]$

as the antiferromagnetic phase B, X assuming values from 0.04 to 0.96, comprising the steps of

1. oxidizing the surface of a metal pigment consisting essentially of the mixed phase



$[Co_xNi_{1-x}]$

to a depth of from 40 to 1000 A at a temperature of up to 400°C; and

2. heating the resulting product in an inert gas atmosphere at a temperature of from 100° to 450°C.

3,959,033

PROCESS FOR MANUFACTURING SILICON-ALUMINUM STEEL SHEET WITH ORIENTED GRAINS FOR MAGNETIC APPLICATIONS, AND PRODUCTS THUS OBTAINED

Mario Barisoni, Via Pomeo Magno n. 26, Albano Laziale (Rome); Massimo Barteri, Piazza Vinci n. 60, Rome; Pietro Brozzo, Via Pompeo Magno, Albano Laziale (Rome); Edmondo Marianeschi, Via Aulo Pompeo N. 6, Terni, and Roberto Ricci Bitti, Via Kennedy n. 32, Lanuvio (Rome), all of Italy

Filed July 23, 1974, Ser. No. 491,152

Claims priority, application Italy, July 23, 1973, 51587/73; Sept. 19, 1973, 52607/73

Int. Cl.² H01F 1/04

U.S. Cl. 148—112 **6 Claims**

1. In a process for making single-oriented silicon steel sheet material having high magnetic induction, comprising the steps of hot rolling silicon steel containing 2.5–3.5% Si, 0.01–0.05% Al., up to 0.06% C, balance essentially iron, annealing the hot rolled steel at 1050° to 1170°C., slow cooling the annealed steel to a predetermined temperature at a cooling rate that does not exceed 10°C. per second, quenching the steel from said predetermined temperature at a rate of 15° to 150°C. per second, cold rolling the steel in the as-quenched condition with a reduction in thickness of 80 to 90%, recrystallizing and decarburizing the steel by annealing the steel in a reducing atmosphere, and finally annealing the steel in an atmosphere consisting essentially of a mixture of nitrogen and hydrogen; the improvement in which said predetermined temperature is 700° to 900°C., the resulting steel having a high hardness phase, including at least one phase other than aluminum nitride, together with aluminum nitride, said high hardness phase having a microhardness of at least 600 HV, said high hardness phase being present in the quantity from 5 to 30% by volume, and the sheet having an average macrohardness of at least 230 HV.

3,959,034

METHOD OF PROVIDING AN OBJECT OF SILICON STEEL WITH A HEAT-RESISTANT, ELECTRICALLY INSULATING COATING

Carl-Artur Akerblom, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Feb. 12, 1973, Ser. No. 331,382
Claims priority, application Sweden, Mar. 1, 1972, 2575/72
Int. Cl.² H01F *1/04*; H01L *3/00*
U.S. Cl. 148—113 3 Claims

1. Method of providing an object of silicon steel with a heat-resistant, electrically insulating silicate coating which comprises applying to the object a suspension in water of particles of at least one substance from the group of oxides and hydroxides of earth alkali metals, at least the main part of said particles having a grain size less than 10 microns and the remainder substantially a grain size less than 50 microns, in an amount to produce a coating having a weight of approximately 3–30 g per m² of the surface of the object and heating the object to a temperature of about 1000°C to 1350°C to form silicate of the earth alkali metal on the surface of the object, in which said suspension includes a substance capable of liberating hydroxyl ions selected from the group of ammonia and organic amines, said substance being present in the suspension in an amount constituting 1–25 per cent by weight of the total quantity of said particles and said substance capable of liberating hydroxyl ions, said substance being volatile at a temperature below the temperature at which silicate is formed.

2. Method according to claim 1, in which the earth alkali metal is magnesium.

3,959,035

HEAT TREATMENT FOR MINIMIZING CRAZING OF HOT-DIP ALUMINUM COATINGS

John M. Sheehan, Penn Hills Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 9, 1973, Ser. No. 404,841
Int. Cl.² B44D *1/092*; C23C *1/08*
U.S. Cl. 148—134 4 Claims

1. In the method for the production of aluminum-coated ferrous product, wherein cold reduced base strip is heated to a temperature within the range of about 1300° – 1750°F and maintained within that temperature range for a time sufficient to substantially recrystallize said base strip and is thereafter passed through a bath of molten aluminum containing from about 4 to 12 percent Si and from about 0.1 to about 3.0 percent Fe and the resultant aluminum coated strip is cooled to yield a coating comprised of a relatively thin interfacial alloy layer and an overlying layer composed of discrete alloy phases in an aluminum matrix,

the improvement which comprises, post heat treating the coated strip at a temperature of about 500° to 1000°F, for a period greater than 10 minutes, wherein the period employed is at least sufficient to materially reduce the crazing tendency of said coating but less than at which the growth of said interfacial alloy layer becomes excessive.

3,959,036

METHOD FOR THE PRODUCTION OF A GERMANIUM DOPED GAS CONTACT LAYER

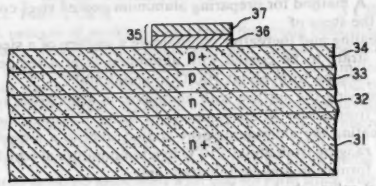
Doris Rahb Ketchow, Kenilworth, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 421,026, Dec. 3, 1973, Pat. No. 3,914,785.
This application Aug. 28, 1974, Ser. No. 501,153
Int. Cl.² H01L *7/38*
U.S. Cl. 148—171 10 Claims

1. Method for the production of a semiconductor device comprising

1. contacting a body of Group III-V compound semiconductor material with a solution, which solution contains gallium, as solvent, and gallium arsenide together with at least one conductivity-determining dopant, as solutes, at a first temperature;

2. reducing the temperature of the body and the solution to a second temperature resulting in the epitaxial deposition of a crystalline layer of gallium arsenide, together with at least one conductivity-determining dopant, on the body; and



3. applying metal to the deposited layer CHARACTERIZED IN THAT the solution includes germanium as a conductivity-determining dopant in a concentration from 20 to 50 atom percent, the first temperature and the second temperature are from 850°C to 700°C and the temperature difference between the first temperature and the second temperature is at least 0.5 centigrade degrees.

3,959,037

ELECTRON EMITTER AND METHOD OF FABRICATION

William A. Gutierrez, and Herbert L. Wilson, both of Woodbridge, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 30, 1975, Ser. No. 573,290
Int. Cl.² H01L *7/36*, *7/38*, *7/54*
U.S. Cl. 148—171 4 Claims

1. A method of fabricating a transmission mode gallium arsenide electron emitter comprising the steps of:

preparing a p-doped gallium arsenide seed crystal for epitaxial growth;

epitaxially growing an n-doped gallium aluminum arsenide etch stop layer onto the gallium arsenide prepared crystal;

epitaxially growing a p-doped gallium aluminum arsenide passivating window layer onto said etch stop layer;

epitaxially growing a p-doped gallium arsenide emitting layer onto said passivating window layer;

preferentially etching away the gallium arsenide seed crystal from the etch stop layer in a desired active region while

leaving a mechanical support ring around the periphery of the device; and

applying ohmic contact means to the emitter layer for effecting a photocathode structure.

4. The photocathode resulting from the practice of the fabrication technique of claim **3.**

3,959,038

ELECTRON EMITTER AND METHOD OF FABRICATION

William A. Gutierrez, and Herbert L. Wilson, both of Woodbridge, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 30, 1975, Ser. No. 573,288
Int. Cl.² H01L *7/36, 7/38, 7/54*
U.S. Cl. 148—171 **10 Claims**

1. A method of fabricating a transmission mode gallium arsenide electron emitter comprising the steps of:

epitaxially growing an etch stop layer of lightly n-doped gallium aluminum arsenide onto one surface of a p-doped gallium arsenide seed crystal;

epitaxially growing a p-doped gallium arsenide emitting layer onto the etch stop layer;

epitaxially growing a lightly p-doped gallium aluminum arsenide passivating window layer onto the emitting layer;

preferentially removing the gallium arsenide seed crystal from the gallium aluminum arsenide etch stop layer;

preferentially removing the etch stop layer of gallium aluminum arsenide from the gallium arsenide electron emitting layer; and

providing ohmic contact means for the exposed surface of the emitting layer.

10. The photocathode resulting from the practice of the fabrication method of claim **1.**

3,959,039

METHOD OF MANUFACTURING VERTICAL COMPLEMENTARY BIPOLAR TRANSISTORS EACH WITH EPITAXIAL BASE ZONES

Maurice Bonis, Herouville, and Bernard Roger, Carpiquet, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 31, 1974, Ser. No. 438,293
Claims priority, application France, Feb. 2, 1973, 73.03748
Int. Cl.² H01L *21/20, 29/06, 27/04*
U.S. Cl. 148—175 **15 Claims**

1. A method of manufacturing a semiconductor device having vertical complementary bipolar transistors each with epitaxial base zone, comprising:

a. providing a semiconductor body having a substrate region of a first type conductivity with a flat surface,

b. epitaxially growing on said flat surface of the substrate region a first epitaxial layer of a second type conductivity opposite to that of the first,

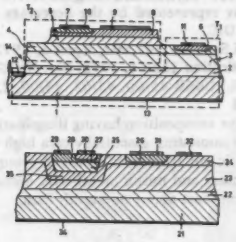
c. forming on only a first portion of the surface of the first epitaxial layer a second epitaxial layer portion of the first conductivity type,

d. forming a first transistor by:

i. forming an emitter zone of first type conductivity in a second portion of the first epitaxial layer and making an emitter connection thereto at the top surface of the first epitaxial layer, said second portion of the first epitaxial layer being adjacent to the said first portion,

ii. making a collector connection to the substrate region adjoining said second portion of the first epitaxial layer,

iii. the base zone of the first transistor being constituted by the said second portion of the first epitaxial layer and,



e. forming a second transistor complementary to the first by:

i. making a base connection at the top surface of the second epitaxial layer,

ii. the first portion of the first epitaxial layer constituting the collector and being internally connected to the adjoining second portion thereof constituting the base zone of the first transistor, and

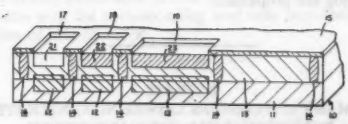
iii. forming an emitter zone of second type conductivity in the second epitaxial layer portion and making an emitter connection thereto at the top surface of the second epitaxial layer portion.

3,959,040

COMPOUND DIFFUSED REGIONS FOR EMITTER-COUPLED LOGIC CIRCUITS

Phillip W. Robertson, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Sept. 1, 1971, Ser. No. 176,875
Int. Cl.² H01L *7/34*
U.S. Cl. 148—186 **9 Claims**



1. In a method for forming a logic circuit in monolithic integrated circuit form, said logic circuit having an emitter-coupled logic transistor and an emitter resistor, the improvement comprising the steps of:

providing a semiconductor region of a first conductivity-type having a layer of a second conductivity-type contiguous therewith, said layer having a surface;

masking the surface of the layer with a first mask; opening up said first mask at locations at which the base region for the emitter-coupled logic transistor and the tub region for said emitter resistor are to be formed;

diffusing into said layer at said locations a dopant to a concentration suitable for forming said base region and said tub region;

remasking said surface of said layer with a second mask; opening up said second mask over said emitter resistor tub region; and

diffusing into said tub region a dopant to a concentration which brings the doping concentration in said tub region to a level sufficient to eliminate spiking in a finished emitter resistor.

3,959,041

ILLUMINATION AND INCENDIARY COMPOSITION FOR EXPLOSIVE MUNITIONS

Charles A. Knapp, Wayne, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 347,602, April 3, 1973, abandoned. This application June 4, 1975, Ser. No. 583,720

Int. Cl.² C06B *45/00, 45/02, 35/00, 25/00*

U.S. Cl. 149—2 **7 Claims**

1. An explosive composition having illuminating and incendiary properties consisting essentially of a high explosive and a solid pyrophoric metal selected from the group consisting of zirconium, titanium and misch metal, said metal possessing a particle size of at least about one-tenth inch.

3,959,042

HIGH IMPETUS, LOW FLAME TEMPERATURE, COMPOSITE PROPELLANTS AND METHOD OF MAKING

Charles R. McCulloch, Shalimar, Fla., and Robert C. Gill, White Plains, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 21, 1973, Ser. No. 418,017

Int. Cl.² C06B *45/10, 25/34, 23/00, 43/00*

U.S. Cl. 149—19.92 **1 Claim**

1. A method for making a high-impetus, low flame temperature composite propellant comprising 10 to 25% of a saturated polymer of a lower hydrocarbon, and 75 to 90% of a polynitramine which comprises

a. dissolving the polymer in a hexane or heptane solvent together with 0–80% toluene by weight of solvent to form a solution;

b. adding the polynitramine to the solution;

c. adding methanol or ethanol to the solution to precipitate the high-impetus low flame temperature propellant;

d. decanting the excess solution

e. drying the propellant.

3,959,043

PRIMARY EXPLOSIVES CONTAINING NITRATED POLYBASIC LEAD SALT AND BORON

Kenneth John Holloway, Welling; George William Charles Taylor, Waltham Abbey, and Arwyn Theophilus Thomas, Orpington, all of England, assignors to The Secretary of State for Defence in Her Brittanic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Division of Ser. No. 621,367, March 7, 1967. This application Jan. 14, 1971, Ser. No. 112,495

Claims priority, application United Kingdom, Mar. 8, 1966, 10216/66

Int. Cl.² C06B *47/10*

U.S. Cl. 149—22 **4 Claims**

1. A primary explosive composition which comprises a polybasic lead salt of a di- or a tri-nitro-substituted resorcinol containing 3,4,5 or 6 atoms of lead per aromatic nucleus in which a minir proportion of finely-divided boron is entrained within, and dispersed throughout, individual crystals of the polybasic lead salt.

3,959,044

PARTICULATE HIGH EXPLOSIVE OF NH_4NO_3 - $CASO_4$ - SENSITIZER

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Mar. 17, 1975, Ser. No. 558,659

Int. Cl.² C06B *33/14*

U.S. Cl. 149—41 **12 Claims**

1. A particulate high explosive composition comprising at least about 70 weight percent of the particulate reaction product of calcium sulfate dihydrate and ammonium nitrate particles containing at least about 5 weight percent calcium sulfate and at least about 60 weight percent ammonium nitrate based on the dry weight of said calcium sulfate and ammonium nitrate, and about 0.5 to about 20 weight percent of an ammonium nitrate sensitizer dispersed in said calcium sulfate-ammonium nitrate reaction product and selected from the group consisting of dispersed combustible carbonaceous matter, elemental sulfur, zinc, aluminum, magnesium and combinations thereof, wherein said particulate reaction product of said calcium sulfate and ammonium nitrate is produced by the method including the steps of intimately mixing said ammonium nitrate particles and calcium sulfate in finely divided form and heating the resultant mixture to an elevated temperature sufficient to induce the endothermic reaction of calcium sulfate with said ammonium nitrate particles.

9. The method of producing the particulate high explosive composition of claim 1 including the steps of mixing said ammonium nitrate sensitizer with said calcium sulfate and ammonium nitrate in either fluid or finely divided solid form, reacting said calcium sulfate dihydrate and ammonium nitrate particles at a temperature of at least about 210°F. sufficient to promote said endothermic reaction and form said particulate reaction product, the particles of which comprise, at least at the outer surfaces thereof, said sensitizer dispersed in the reaction product of said calcium sulfate and ammonium nitrate.

3,959,045

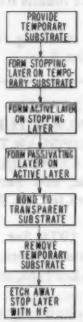
PROCESS FOR MAKING III-V DEVICES

George A. Antypas, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Nov. 18, 1974, Ser. No. 524,691

Int. Cl.² H01L *21/208*

U.S. Cl. 156—3 **6 Claims**


PROVIDE TEMPORARY SUBSTRATE
FORM STOPPING LAYER ON TEMPORARY SUBSTRATE
FORM ACTIVE LAYER ON STOPPING LAYER
FORM PASSIVATING LAYER ON ACTIVE LAYER
BOND TO TRANSPARENT SUBSTRATE
REMOVE TEMPORARY SUBSTRATE
ETCH AWAY STOP LAYER WITH HF

1. In a process for making a photocathode device for providing free electrons in response to incident photons, the steps of: providing a temporary substrate of GaAs, forming a stopping layer of AlGaAs on the temporary substrate, forming on the stopping layer an active layer of GaAs for delivering free electrons in response to photons incident thereon, forming a passivating layer of AlGaAs on the active layer, bonding the temporary substrate and the layers to a photon transparent substrate with the passivating layer closest to the transparent

substrate, removing the temporary substrate, and effecting removal of the stopping layer by etching with HF.

2. The process of claim 1 wherein the layers are formed by liquid phase epitaxial growth.

3,959,046

PROCESS FOR THE AUTOMATIC CHECKING AND CONTROL OF ETCHING MACHINES

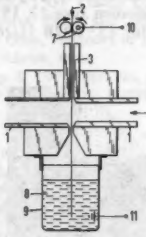
Egon Bussmann, Munich, and Walter Pritzl, Munich-Unterhaching, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 30, 1974, Ser. No. 437,928

Claims priority, application Germany, Feb. 1, 1973, 2304933

Int. Cl.² C23F 1/02

U.S. Cl. 156—7 **2 Claims**



1. A process for checking and controlling the operation of an etching machine which comprises providing a measuring compartment, continuously circulating etching solution from said machine through said measuring compartment, rapidly advancing an end portion of a measuring wire through said measuring compartment, holding said wire in a stationary position therein, measuring the time required to etch off the end portion of said wire and thereafter sequentially rapidly advancing and holding end portions of said wire stationary for etching off succeeding end portions of said wire.

3,959,047

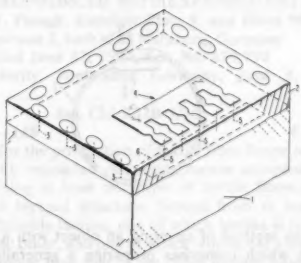
METHOD FOR CONSTRUCTING A ROM FOR REDUNDANCY AND OTHER APPLICATIONS

Gene Stoddard Alberts, Essex Junction; Paul Alden Farrar, South Burlington, and Robert Lee Hallen, Essex Junction, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 30, 1974, Ser. No. 510,667

Int. Cl.² C23F 1/02

U.S. Cl. 156—8 **10 Claims**



1. In a method for manufacture of integrated semiconductor structure the improvement comprising blanket depositing a composite metal film upon a passivating film of said structure followed by simultaneously forming interconnecting pad limiting via metallization and a redundancy read only metal link pattern thereon.

3,959,048

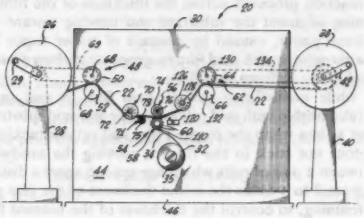
APPARATUS AND METHOD FOR REPAIRING ELONGATED FLEXIBLE STRIPS HAVING DAMAGED SPROCKET FEED HOLES ALONG THE EDGE THEREOF

James S. Stanfield, 900 Euclid, Santa Monica, Calif. 90403, and Paul W. Trester, 2312 9th St., Olivenhain, Calif. 92024

Filed Nov. 29, 1974, Ser. No. 528,028

Int. Cl.² B32B 35/00

U.S. Cl. 156—94 **25 Claims**



18. A method for repairing a substantial length of a motion picture film strip having a large number of damaged sprocket feed hole perforations located along the side edge portion of the film by applying to the damaged side edge portion an elongated flexible repair tape carrying preformed replacement feed hole perforations therein, said method comprising the steps of:

aligning an initial portion of said elongated tape with an initial side edge portion of said film strip to be repaired;

aligning one feed hole perforation in said initial portion of said tape with one feed hole perforation in said initial side edge portion of said film so that said perforations substantially coincide;

bonding said initial portions together in said aligned condition;

and sequentially aligning and bonding continuously the remaining feed hole perforations of said tape with the remaining feed hole perforation locations along said side edge portion of said film strip in a manner such that each feed hole perforation in said tape strip substantially coincides with the corresponding feed hole perforation location of said film strip.

3,959,049

PROCESS FOR PRODUCTION OF ARTIFICIAL LEATHERS HAVING AIR PERMEABILITY

Yoshinobu Tanaka; Hidehiko Maki, both of Kyoto; Tamio Ishiai, Wakayama; Tasaku Nishii, Wakayama, and Singi Oota, Wakayama, all of Japan, assignors to Nippon Cloth Industry Co., Ltd., Kyoto, Japan

Filed June 26, 1974, Ser. No. 483,099

Claims priority, application Japan, July 4, 1973, 48-74885

Int. Cl.² B29D 27/04; B32B 5/20, 31/14

U.S. Cl. 156—79 **10 Claims**

1. A process for preparing air-permeable artificial leather having excellent surface scratching strength which comprises

1. forming a liquid mixture consisting essentially of

a. an isocyanate-terminated polyurethane prepolymer prepared by reacting (1) a polyester diol derived from an aliphatic dicarboxylic acid, with (2) an organic polyisocyanate, wherein the ratio of isocyanate group equivalent/hydroxyl group equivalent is from 2.0 to 4.0/1.0,

b. an effective amount of a foam stabilizer for a polyurethane foam, and

c. an effective amount of a catalyst for polymerizing the polyurethane prepolymer

said mixture being substantially solvent-free and water-free and having a viscosity of from 70 to 1000 poises;

2. coating a surface coating film of said liquid mixture onto a release paper in an amount of from 50 to 400 grams of said liquid mixture per square meter of said release paper;

3. applying a water vapor-permeable substrate to the exposed surface of said coating film on said release paper to form a sandwich in which said film is between said release paper and said substrate;

4. moving said sandwich through an ambient atmosphere of high humidity having a dry bulb temperature of from 40° to 95°C and a relative humidity of at least 60%, for a time period of from 30 seconds to 5 minutes, so that a foaming reaction proceeds across the thickness of the film beginning adjacent the substrate and moving toward the release paper, caused by contact of water vapor in said atmosphere with said film to generate carbon dioxide gas whereby to foam said film;

5. while maintaining said foamed film in said sandwich relationship with said release paper and said substrate and at a time when the foamed film still retains tackiness but does not stick to the fingers, moving the sandwich between a pair of rolls which are spaced apart a distance of from 2 to 4 times the initial thickness of the film prior to foaming, to control the thickness of the foamed film;

6. completing the foaming and polymerization reactions; and

7. removing the release sheet from the sandwich whereby to obtain a foamed microporous polyurethane sheet bonded to said substrate as a final artificial leather product.

3,959,050

PLAQUE BOARD WITH POLYURETHANE CORE AND METHOD FOR CONSTRUCTION SAME

William A. Hooper, Jr., Kansas City, Mo., assignor to John C. Gurche, Overland Park, Kans.

Filed July 15, 1974, Ser. No. 488,289

Int. Cl.² B32B *5/18, 1/04*

U.S. Cl. 156—79 **1 Claim**

1. A method of constructing a unitary article, such as a plaque board, having only wooden surfaces exposed, said method comprising the steps of:

providing first and second wooden veneer sheets;

constructing a continuous, endless, all wooden frame having an open interior completely bounded by said frame, said frame having a preselected shape and an exposed exterior surface extending continuously thereon, said exterior surface including first and second portions joined together in angled relation;

securing said frame directly against said first veneer sheet to locate said first veneer sheet in position to close one side of said frame interior and to locate said frame in position to form a continuous peripheral border having said first and second surface portions exposed;

inserting a liquid foam substance within said frame interior and against said first veneer sheet, said foam substance being adapted to expand, solidify, and become bonded directly to said veneer sheets and frame;

securing said second veneer sheet directly to said frame in spaced relation from said first veneer sheet after the insertion of said foam substance but prior to the completion of the expansion and solidification of said foam substance, said second veneer sheet thereby closing the other side of said frame interior to cooperate with said first veneer sheet and frame to completely enclose said foam substance within said frame interior; and

pressing and holding said first and second veneer sheets tightly against said frame as said foam substance expands to fill said frame interior and press outwardly directly against said veneer sheets and frame, whereby said foam substance becomes bonded to said veneer sheets and frame as it solidifies to form a rigid core completely internally of said frame interior.

3,959,051

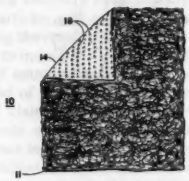
FABRIC FORMED BY HEAT SEALING, SHRINKING AND FOAMING BACKING

Henry G. Schirmer, Spartanburg, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Division of Ser. No. 164,549, July 21, 1971, Pat. No. 3,755,062. This application June 12, 1973, Ser. No. 369,368

Int. Cl.² B32B *31/26*

U.S. Cl. 156—85 **5 Claims**



1. The method of forming a fabric comprising bonding spaced portions of a fibrous material to an oriented thermoplastic sheet by pressing the fibrous material to the sheet with a heated bar means at intervals and at a temperature sufficient to relieve at least some of the shrinkability of said oriented thermoplastic sheet at said intervals, preventing the bonding of said fibrous material to said oriented thermoplastic sheet intermediate said intervals, and thereafter subjecting said oriented thermoplastic sheet with said bonded fibrous material to temperatures sufficient to shrink said sheet intermediate said intervals and sufficient to substantially completely dimensionally stabilize said thermoplastic sheet against shrinking at temperatures below a predetermined minimum.

3,959,052

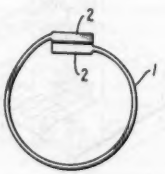
WRAP AROUND HEAT SHRINKABLE ARTICLE

Mark J. Stanek, Sunnyvale, Calif., assignor to Sigmaform Corporation, Santa Clara, Calif.

Filed Mar. 21, 1975, Ser. No. 560,329

Int. Cl.² B32B *31/18*

U.S. Cl. 156—86 **2 Claims**



1. The method of covering an object with a wrap-around closure which comprises preparing a generally rectangular sheet of a cross-linked vinyl polymer which has the property of shrinking to its original dimensions when it is heated after having been stretched at a temperature above its crystalline melting point and then cooled to a temperature below the

crystalline melting point, clamping both ends of the sheet with clamping means covering relatively narrow, generally rectangular end sections, heating the central section to a temperature above the crystalline melting point of the polymer, stretching the heated central section such that its stretched length is substantially greater than its prestretched length, cooling the central section to a temperature below the crystalline melting point while in stretched condition, shaping the sheet into tubular form with two end sections aligned and overlapping, placing the tubular sheet around the object to be closed, applying a lower alkyl cyanoacrylate adhesive to one or both of the facing surfaces of the end sections and pressing the end sections together and then heating the central section to a temperature in the range 250°–375°F. to shrink the central section into tight relationship with the object to be closed.

3,959,053

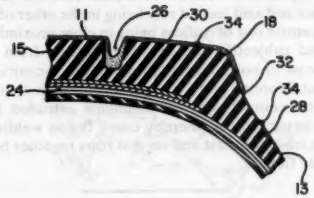
SURFACE TREATMENT OF TIRES TO REDUCE FLASH

George H. Fisk, Munroe Falls, and James A. Loulan, Jr., Uniontown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 5, 1974, Ser. No. 494,686

Int. Cl.² B29C *25/00*; B29H *17/00*

U.S. Cl. 156—123 **7 Claims**



1. A method of manufacturing a rubber or rubberized article in which the article is preformed of a material including unvulcanized elastomeric material and subsequently made to conform to a mold having at least two sections with vent holes and vulcanized, the improvement comprising; subjecting selected portions of the outer surface of the preformed article prior to the vulcanization of the elastomeric material to a dosage of electron radiation between one and ten megarads from a source having an intensity of between 500,000 and 3,000,000 KV which is sufficient to at least inhibit the flow of the elastomeric material into vent holes and parting lines between sections of the mold, but insufficient to prevent complete conformance of the preform to the mold cavity.

3,959,054

PROCESS FOR THE PRODUCTION OF TEXTILE FIBER FLEECES REINFORCED WITH EXPANDED NETTING

Helmut E. W. Pietsch, Danziger Platz 9, and Horst Nicolaus, Waeschterstrasse 2, both of 85 Nurnberg, Germany

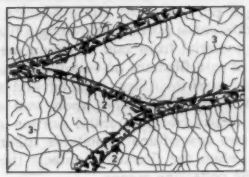
Filed June 17, 1974, Ser. No. 479,792

Claims priority, application Germany, June 5, 1973, 2328470

Int. Cl.² B32B *3/26*

U.S. Cl. 156—148 **4 Claims**

1. Process for the production of textile fiber fleece material reinforced with expanded net, said process comprising the steps of applying at least one layer of textile fibers onto a non-expanded layered structure formed from at least two thermally softenable lamina, one of which lamina is superimposed upon the other, and one of which lamina has a softening temperature lower than that of the other lamina, heating the layered structure to at least the softening temperature of the component having the lower softening temperature, tensioning the heated assembled structure so that the component having the higher softening temperature forms an expanded net and the component having the lower softening temperature is spread sufficiently to cause it to tear into separate



scales or flakes, which scales or flakes adhere to the expanded net formed of the higher melting component, or adhere to the textile fibers.

3,959,055

TEXTILE APPARATUS AND PROCESS

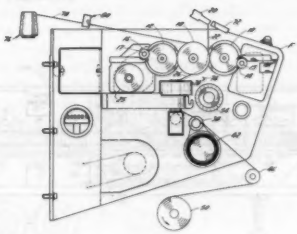
Josef Milan Slanik, Montreal, Canada, assignor to The Bobtex Corporation Limited, Montreal, Canada

Filed Oct. 21, 1974, Ser. No. 516,390

Claims priority, application United Kingdom, Oct. 23, 1973, 49376/73

Int. Cl.² G03B *1/56*; D02G *3/00*

U.S. Cl. 156—167 **14 Claims**



1. In an apparatus suitable for the manufacture of composite yarns including at least a pair of spaced-apart rotatable rollers with at least one of the rollers having collecting means for receiving a layer of yarn-forming material thereupon, and extrusion means adapted to supply at least one filament of inter-fiber binding material mounted on one side of the rotatable rollers, the improvement wherein the apparatus includes start-up means, said start-up means comprising a rotatable start-up roller, said start-up roller mounted on a side of said pair of rotatable rollers opposed to the side on which said extrusion means are mounted, said start-up roller having a portion of its circumference larger than a further circumferential portion, said further circumferential portion adapted to receive a leading edge of the filament thereon, means for rotating said start-up roller such that said filament will wind itself upon said start-up roller from said further portion to said larger circumferential portion, said start-up roller being located such that the filament, when passing from said further portion to said larger circumferential portion, passes between the pair of spaced-apart rotatable rollers and contacts the yarn forming material, and cutting means positioned in the path of said filament to cut said filament after the filament has been placed in contact with the yarn forming material.

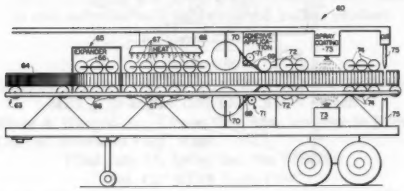
13. A method suitable for the introduction of a filament of inter-fiber binding material in an apparatus for the manufacture of composite yarn having at least two spaced-apart rotatable rollers, one of which has a collecting means for forming a layer of yarn-forming material from a source thereof, the method comprising the steps of providing an extrusion means adapted to extrude at least one filament of inter-fiber binding material, mounting said extrusion means on one side of the

two spaced-apart rotatable rollers, providing a start-up roller on a side of said two spaced-apart rollers opposed to the side on which said extrusion means are mounted, said start-up roller having a portion of its circumference larger than a further circumferential portion, extruding a filament of inter-fiber binding material from said extrusion means, placing a leading edge of said filament on said further circumferential portion of said start-up roller, rotating said start-up roller, allowing said filament to wind upon said start-up roller towards said larger circumferential portion until it passes between the two spaced-apart rotatable rollers, and cutting said filament when the filament contacts the yarn-forming material on the collecting means.

3,959,056
LIGHTWEIGHT REFLECTIVE PANELS FOR SOLAR-THERMAL POWER PLANTS AND METHODS OF FORMING SUCH PANELS

Harry W. Caplan, 3397 E. Monmouth Road, Cleveland Heights, Ohio 44118

Division of Ser. No. 407,943, Oct. 19, 1973, Pat. No. 3,841,738. This application July 1, 1974, Ser. No. 484,662
Int. Cl.² B31D *3/02*
U.S. Cl. 156—197 **12 Claims**



1. A process for forming an elongated lightweight curved reflective panel for use in solar-thermal systems, comprising the steps of:

a. forming an expansible core structure including strips of flexible material of substantially uniform width positioned side-by-side with adjacent strips bonded together at regularly spaced intervals to provide an expansible core of substantially uniform thickness which, when expanded, will define an array of open ended cells;

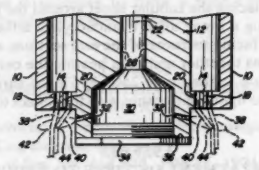
b. forming a self-supporting parabolic panel of substantially uniform thickness in a substantially continuous process including the steps of feeding said core structure along a feed path through sequential operating stations where portions of the core structure are expanded and conformed to a predetermined generally parabolic configuration, whereafter facing sheets are fed along the feed path and are bonded to opposite side portions of the shaped, expanded core structure to form a self-supporting parabolic panel with one of said sheets defining a mounting surface which is curved in cross section to form substantially a part of a parabola and with the other of said sheets defining a corresponding curved surface spaced at a substantially uniform distance from said curved mounting surface; and,

c. securing a reflective material to said mounting surface to provide a reflector.

3,959,057
MEANS AND METHOD FOR PRODUCING PLASTIC NETTING

Jesse J. Smith, P.O. Box 162, Garden City, Kans. 67846

Filed Apr. 7, 1975, Ser. No. 565,691
Int. Cl.² B29B *5/04*
U.S. Cl. 156—244 **11 Claims**

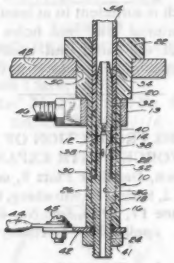


1. A method for producing plastic netting comprising: concurrently rotating a pair of concentric plastic extruding dies in opposite directions about a common axis; extruding hot plastic filaments from first and second adjacent concentric circular rows of plastic extrusion orifices; said first row being in one of said dies and said second row being in the other of said dies; said concentric row of orifices being in close proximity to each other; and subjecting the filaments passing from said first circular row to hot pneumatic fluid under pressure and thus blowing and forcing said filaments from said first circular row into fusion contact with the filaments extruded from said second circular row to thereby cause fusion welding of said filaments from said first and second rows together by said hot pneumatic fluid.

3,959,058
METHOD AND APPARATUS FOR BUTT-WELDING TUBULAR PLASTIC MEMBERS TO EACH OTHER

Lucien M. Rath, Milwaukee, and James L. Clark, Whitefish Bay, both of Wis., assignors to Plastronics, Inc., Milwaukee, Wis.

Filed Nov. 8, 1974, Ser. No. 522,045
Int. Cl.² B29C *19/02*, *19/00*
U.S. Cl. 156—272 **4 Claims**



4. A method of butt-welding tubular plastic members to each other comprising the steps of:

a. positioning a pair of tubular members of plastic material in end-to-end abutting relationship inside a cylindrical cavity formed in a mold member made of insulating material;

b. positioning an electrode pin member formed of a metallic conductive material inside said tubular members a sufficient distance whereby the end portion of said pin member is positioned at the abutting edges of said tubular members;

c. positioning an electrode ring member around the outside of said mold member in the area where said tubular members abut each other; and

d. passing radio frequency energy between said electrode pin member and said electrode ring member to thereby heat the abutting ends of the tubular members and cause them to be welded together; and

e. cooling the areas of the two plastic tubular members adjacent the abutting ends thereof during step (d) by directing a flow of cooling fluid to such abutting areas.

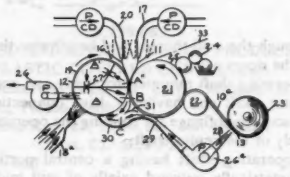
3,959,059
METHOD AND APPARATUS FOR FLOCKING CONTINUOUS WEBS

Leon Rollin Alexander, 4335 Andy St., Lakewood, Calif. 90712, and Donald F. Dreher, P. O. Box 177, East Brookfield, Mass. 01515

Continuation-in-part of Ser. No. 706,707, Feb. 16, 1968, abandoned, which is a continuation of Ser. No. 504,407, Oct. 24, 1965, abandoned. This application Sept. 6, 1972, Ser. No. 286,644

Int. Cl.[2] B29F *3/00*

U.S. Cl. 156—244 **16 Claims**



1. In a process for preparing a flocked composite article comprising a formed base having a discrete covering of flock disposed on one surface, said process comprising the steps of

a. introducing said base with said surface transiently receptive of a mergeable portion of said covering to effect adhesional attachment,

b. advancing said base as described toward a converging nip comprising a traveling conveyance and a web support member juxtaposed,

c. depositing a stratum of flock upon the periphery of said conveyance,

d. securing said stratum transiently thereon by vacuous means communicative through said periphery,

e. motioning said stratum toward said nip,

f. merging said portion with said surface while in its receptive state adjacent said nip,

g. passing the composite through said nip, and

h. withdrawing said article uninterruptedly.

3,959,060
METHOD OF MAKING FISHING LURE WITH DECORATIVE WEIGHTING

William H. Jones, 8721 Elm St., Kansas City, Mo. 64138

Filed Dec. 13, 1974, Ser. No. 532,401

Int. Cl.[2] A01K *85/00*; B29D *3/00*; B29F *1/10*

U.S. Cl. 156—245 **4 Claims**

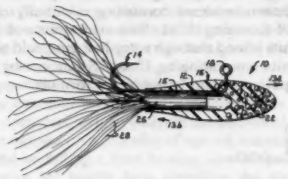
1. A method of manufacturing a spotted fishing lure, said method comprising the steps of:

correctly aligning a fish hook in an appropriate mold,

injecting a liquid plastic interiorly of said mold to form a body thereby interconnecting said body and a portion of said hook,

introducing a plurality of pellets into the mold thereby distributing said pellets within said body,

inserting a core pin in said mold before hardening said plastic,



hardening said plastic,

withdrawing said core pin after hardening said plastic, thereby exposing an orifice in said lure body, and

attaching a tail to said lure interiorly of said orifice.

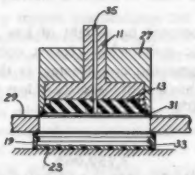
3,959,061
APPARATUS AND METHOD FOR INSERTING MEMBRANE INTO CONTAINER LIDS

Lawrence E. Renck, Hoffman Estates, and Matthew J. Bozinovich, Glenview, both of Ill., assignors to Kraftco Corporation, Glenview, Ill.

Filed Oct. 24, 1974, Ser. No. 517,494

Int. Cl.[2] B32B *31/26*, *31/04*; B65C *41/04*; C09J *7/00*

U.S. Cl. 156—262 **9 Claims**



1. Apparatus for inserting a flexible liner into container lids comprising a piston, means for actuating said piston in a reciprocal path, means for supporting a container lid in a position substantially normal to said reciprocal path of said piston at one end thereof, means for interposing a flexible liner between said piston and said container lid and resilient means affixed to the end of said piston nearest said interposed liner for moving said interposed liner along said reciprocal path and for urging said flexible liner into a flat position within said container lid, said resilient means being a lip of resilient material extending outwardly from the periphery of said piston.

8. A method in accordance with claim 7 wherein said container lid has a container engagement flange extending around the interior wall of said lid and said flexible liner is forced over said flange and is urged into flat position within said container lid by compression of said resilient lip.

3,959,062
METHOD OF JOINING SURFACES USING SEGMENTED COPOLYESTER ADHESIVE

George Lok Kwong Hoh, and Akira Tsukamoto, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 279,370, Aug. 10, 1976, Pat. No. 3,832,314. This application June 13, 1974, Ser. No. 478,971

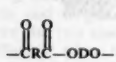
Int. Cl.[2] C09J *7/00*

U.S. Cl. 156—313 **9 Claims**

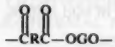
4. In the method of preparing reinforced flexible hose containing an inner tube layer, an overlaying reinforcement layer impregnated with binder, and an outer cover layer, the improvement which comprises applying as the binder a thermoplastic hot melt adhesive composition by hot melt application

which comprises, based on the total thermoplastic components,

A. 1 to 99 percent by weight of thermoplastic segmented copolyester elastomer consisting essentially of a multiplicity of recurring short chain ester units and long chain ester units joined through ester linkages, said short chain ester units amounting to 15 to 75 percent by weight of said copolyester and being of the formula



and said long chain ester units amounting to 25 to 85 percent by weight of said copolyester and being of the formula



wherein R is the divalent aromatic radical remaining after removal of the carboxyl group from aromatic dicarboxylic acid having a molecular weight of less than 350, D is the divalent radical remaining after removal of the hydroxyl groups from organic diol having a molecular weight of less than 250, and G is the divalent radical remaining after removal of the terminal hydroxyl groups from long chain glycol having an average molecular weight of 350 to 6000, said copolyester having a melt index of less than 150 and a melting point of at least 125°C., and

(B) 1 to 99 percent by weight of low molecular weight thermoplastic resin which forms compatible mixtures with the segmented copolyester, is thermally stable at 150°C., and has a melt viscosity of less than 10,000 centipoises at 200°C.

3,959,063

METHOD OF PROTECTING A SURFACE FROM A HEAT SOURCE

Peter Frederick Hawthorne, Birmingham, England, assignor to Foseco International Limited, Birmingham, England

Division of Ser. No. 252,463, May 11, 1972, abandoned. This application Oct. 1, 1973, Ser. No. 402,323

Claims priority, application United Kingdom, June 2, 1971, 18637/71

Int. Cl.[3] C09D *1/02*; F01D *25/14*; F03B *11/02*

U.S. Cl. 156—325 **11 Claims**

1. In the method of protecting a surface from a heat source by adhering a refractory heat-insulating material to the surface, said method involving the steps of applying an adhesive to the material or surface and then bringing said material and surface together to effect said bonding, the improvement which comprises applying, as the adhesive, one consisting essentially of 20–90% by weight aqueous alkali metal silicate solution, 10–80% by weight of a powdered metal selected from the class consisting of iron, copper, aluminum and aluminum alloys, and an effective amount up to 15% by weight of a fibrous refractory material.

3,959,064

TIRE BUILDING DRUM

John W. Touchette, Hartville, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed July 8, 1974, Ser. No. 486,718

Int. Cl.[3] B29H *17/16*

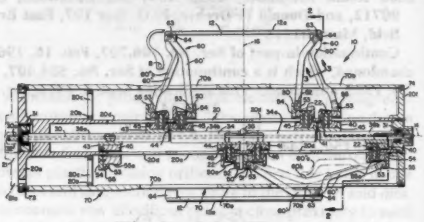
U.S. Cl. 156—417 **6 Claims**

1. A tire building drum useful for processing tire carcasses having a nominal bead diameter range from 24 to 36 inches and to accommodate tire carcasses previously built on forms having radial heights or crown ranging from 1 to 12 inches, comprising in combination:

a plurality of tire support members extending lengthwise in the direction of the axis of the drum in cylindrical array coaxial with said axis an engageable with the interior surface of said tire only in a central circumferential zone thereof spaced inwardly from each of the bead portions of such tire being continuously adjustable between limiting diameter positions, respectively, nearer to and farther from the axis;

a pair of pivot pin mountings fixed on radially inward surfaces of each of the support members near the respective axial ends thereof and equidistantly from the mid-plane of the drum, each mounting accommodating a link pin;

a hollow elongate center shaft having at one of its ends a flange mountable for coaxial corotation on a tire building machine spindle and having a plurality of slots extending



through the wall thereof and lengthwise thereof parallel to the drum axis;

an operating shaft mounted rotatably and coaxially in said center shaft and having a drive connection at its end adjacent said flange for rotating the operating shaft relatively of the center shaft;

said operating shaft having a central portion extending symmetrically outward axially of said mid-plane and a pair of end portions extending respectively oppositely outward axially from said central portion, the central portion having a threaded part with righthand threads in one direction from said mid-plane and a part with lefthand threads in the other direction from said mid-plane, both righthand and lefthand thread parts being of equal predetermined pitch and lead, and the respective end portions being threaded one righthand and the other lefthand at said predetermined pitch and lead, said one righthand end portion being adjacent said lefthand thread part of the central portion and said lefthand end portion being adjacent said righthand thread part of the central portion;

said end portions having outside diameters less than the outside diameter of the central portion of the operating shaft, said operating shaft having a stop collar disposed thereon symmetrically of said mid-plane and between the righthand and the lefthand part;

a pair of nuts operatively engaged respectively with one of the end portions of said operating shaft and with the adjacent threaded part of said central portion such that said nuts move equally and oppositely of each other in response to rotation of said operating shaft relatively of said pair of nuts;

and another pair of nuts operatively engaged respectively with the other said end portion and with the adjacent threaded part of said central portion such that said nuts move equally and oppositely of each other in response to rotation of said operating shaft relatively of said other pair of nuts and such that the nuts engaged with the respective threaded parts of the central portion also move equally and oppositely in response to said rotation;

a cylindrical, link-support tube fixed coaxially of said central shaft, spaced radially outwardly and extending axially thereof, said tube having a plurality of axially extending slots opening through the cylindrical wall of the tube, such slots being arranged in axially spaced sets of slots equally spaced around said tube and individually aligned

axially with corresponding slots of the other such sets;

a pair of trunnion rings mounted coaxially about end slidably on said center shaft and associated with said central portion of the operating shaft, each ring having a key fixed thereon and to a respectively associated one of said nuts operatively engaged on said central portion, each said key being slidable in the associated one of the slots in said center shaft;

a second pair of trunnion rings mounted coaxially about and slidably on said center shaft, each being associated respectively with one of said end portions of the operating shaft;

each of said trunnion rings having a plurality of recesses spaced circumferentially therearound and a semitoroidal annular groove therein intersecting said recesses and concentric with the drum axis, a circumferential row of link pivot pins disposed end-to-end in said groove, a pin-retaining plate removably affixed on each said trunnion ring retaining said pivot in said groove; and

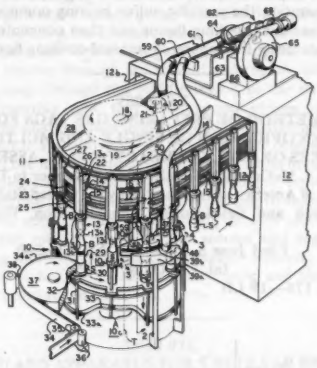
a pair of links each link thereof being pivotably connected at its radially inner end to a respectively associated one of said trunnion rings and each link extending radially outwardly through and slidable in a respective one of the slots in said link-support tube, there being a plurality of said pairs of links each said pair being operatively associated with a respective one of said pivot pin mountings.

3,959,065

METHOD AND APPARATUS FOR PRODUCING PLASTIC-COVERED CONTAINERS

Richard I. Ashcroft, Alameda, Calif., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 25, 1974, Ser. No. 464,224
Int. Cl.² B29D *3/00*
U.S. Cl. 156—423 **10 Claims**



1. An apparatus for assembling tubular, heat shrinkable, thermoplastic sleeves telescopically onto base articles, having a turret and plural spaced mandrels thereon, a final heating device for shrinking the sleeves onto said articles, a base article carriage with plural spaced chucks thereon carrying said articles in a path over the mandrels to receive a sleeve on each and thereafter into said final heating device and a stripper means operable at an assembly station in response to turret movement of each of the mandrels through said station for moving the sleeve from the mandrel onto an overhead article, the improvement therein comprising a contoured narrow, band-like elongated heat emitting means for emitting a narrow band-like pattern of heat corresponding in its longitudinal extent with said path adjacent said assembly station and in the direction of said heating device, and means supporting the heat emitting means along said path adjacent said assembly station at an elevation on the base article for directing heat in a narrow, intermediate band-like region of the sleeve assembled on the article being carried immediately beyond said assembly station, thereby shrinking an intermediate annular band-like portion of the sleeve initially into annular engagement on the article sufficiently to hold said sleeve in position thereon during travel through the balance of said path and into said final heating device.

8. In apparatus for assembling a preformed, highly circumferentially oriented thermoplastic sleeve that is heat shrinkable on a container article; wherein the sleeves of said thermoplastic are carried on a plurality of spaced mandrels of a turret device, and including a final heating device spaced from the turret device for totally heat shrinking the sleeves on the articles, an article carriage having plural spaced apart chucks thereon carrying said articles in a path in registry with the mandrels at an assembly station and thereafter, upon receiving a thermoplastic sleeve on the article, carrying same into and through said final heating device, and a reciprocating sleeve stripper means operable in response to movement of each of the mandrels by said turret through the assembly station by a cam and follower for shifting the stripper means axially along the mandrels from a retracted first position to an extended second position thereby transferring each sleeve telescopically from the mandrels to the articles in an assembled position with the stripper means at said second position, the improvement therein comprising:

an elongated, narrow heat applying means, and

means supporting the heat applying means along the path of the movement of the articles at the assembly station whereat the stripper means is in its extended second position,

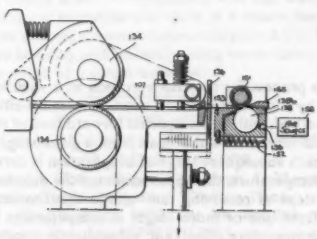
said supporting means maintaining the elevation of the narrow, elongated heat applying means opposite an intermediate region of the assembled sleeve while carried in said path toward said final heating device for heating a band-like region of the thermoplastic sleeve intermediate its axial ends while carried on the container in its path along said heat applying means sufficiently to shrink an annular band-like region of the sleeve into firm engagement with the article, thereby assuring the assembled position of the sleeve on the article at the final heating device.

3,959,066

APPARATUS FOR MANUFACTURING THE BODY PORTION OF A COLLAPSIBLE SQUEEZE TUBE

William P. Miller, Meriden, Conn., and Robert W. Twigg, Rockford, Ill., assignors to Polytube, Inc., Hamden, Conn.

Filed Sept. 13, 1974, Ser. No. 505,925
Int. Cl.² B21D *5/10*; **B29D** *23/10*
U.S. Cl. 156—459 **14 Claims**



1. In an apparatus for fabricating a flexible cylinder from a multi-ply flexible web material having metal and plastic plies, the improvement comprising:

a preform block having a cylindrical cavity and a first longitudinal opening adapted to receive the multi-ply web material,

a feed roller member mounted outside of said cavity and having an axis parallel to the axis of said cylindrical cavity, the periphery of said feed roller being nearly tangent to said cylindrical cavity at said opening, there being a gap between the periphery of said roller and the geometric cylinder defined by the periphery of said roller and the geometric cylinder defined by said cavity.

a pressure plate member mounted outside of said cavity and having an end positioned at said opening, a biasing surface of said pressure plate being normally spaced from the periphery of said roller by a predetermined spacing less than the thickness of said web material, said pressure plate forcing the web material fed into said cavity into contact with said periphery of said feed roller,

biasing means coupled to one of said roller and plate members to bias said one of said members towards the other of said members,

a stop associated with said one of said members to provide said predetermined spacing as the lower limit of said space between said members,

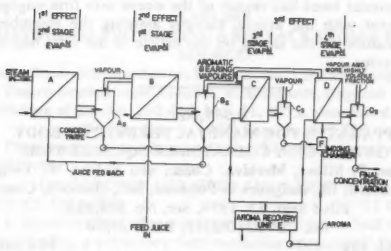
the periphery of said feed roller spaced from whatever web material is fed into said cavity after the trailing edge of said web material has passed said biasing surface of said pressure plate.

3,959,067

CONCENTRATION OF VOLATILES-BEARING PRODUCTS

Ruth Cohn, Ramat-Gan, Israel, assignor to The A.P.V. Company Limited, Crawley, England

Filed Dec. 6, 1974, Ser. No. 530,082
Int. Cl.[2] B01D *1/26;* **A23F** *3/00, 5/00*
U.S. Cl. 159—17 R **6 Claims**



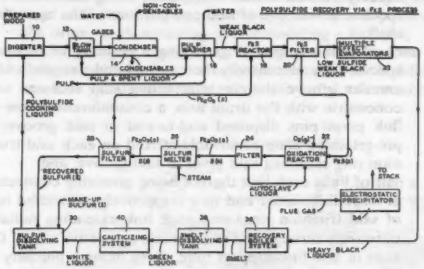
1. In a process for the concentration of a volatiles-bearing product by a low-temperature, short-time, multi-effect evaporation method, with at least partial forward feed of the process liquid and vapour so that at least from a given stage of evaporation, each subsequent stage of evaporation is carried out at a lower temperature: the improvement of the process comprising the steps of removing the volatile constituents with the vapour from one or more stages at temperatures below the highest temperature effect, and subsequently condensing and recovering these constituents in a separate recovery unit, and then recombining the volatile constituents with the partially concentrated product before at least one final stage of evaporation at a temperature lower than that at which they were originally distilled off whereby a more highly volatile fraction of the recombined volatile constituents and partially concentrated liquid is again removed with the vapour in the said at least one final stage of evaporation.

3,959,068

PROCESS AND APPARATUS FOR RECOVERY OF SULFUR FROM A POLYSULFIDE PULPING OPERATION

Robert A. McIlroy; Robert E. Matty, and Walter C. Lapple, all of Alliance, Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Oct. 24, 1974, Ser. No. 517,713
Int. Cl.[2] D21C *3/24, 11/12*
U.S. Cl. 162—17 **20 Claims**



1. In a high sulfidity chemical pulping process wherein cellulosic material is digested in a cooking liquor bearing sulfur compounds, forming a pulp and residual cooking liquor, a process for chemical recovery wherein the residual cooking liquor is washed from the pulp, concentrated and then incinerated to recover chemicals contained therein, the improvement which comprises:

a. Reacting the residual cooking liquor with a metallic oxygen bearing compound to form a metallic sulfur bearing compound in the residual cooking liquor and then

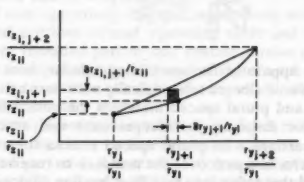
b. Separating the metallic sulfur bearing compound from the residual cooking liquor and then concentrating and incinerating the separated residual cooking liquor.

3,959,069

METHOD OF PREPARING GAS TAGS FOR IDENTIFICATION OF SINGLE AND MULTIPLE FAILURES OF NUCLEAR REACTOR FUEL ASSEMBLIES

Norman J. McCormick, Seattle, Wash., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 5, 1974, Ser. No. 476,500
Int. Cl.[3] G21C *17/06*
U.S. Cl. 176—19 LD **16 Claims**



1. A method for the identification of failed fuel assemblies in a nuclear reactor having a cover gas therein wherein multiple assembly failures can bne distinguished from single assembly failures comprising the steps of incorporating a blended mixture of inert, non-radioactive gas tags in each fuel pin of each of said fuel assemblies, said blended mixture of inert, non-radioactive gas tags having gas tag ratios that are located on a curved surface or a graphical tag ratio diagram and

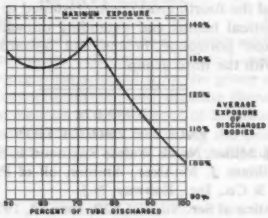
thereafter monitoring said cover gas for the presence of said blended mixture of said inert, non-radioactive gas tags.

3,959,070

METHOD OF OPERATING A NEUTRONIC REACTOR

Wallace K. Woods, Richland, Wash., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 18, 1952, Ser. No. 321,080
Int. Cl.² G21C *19/20*
U.S. Cl. 176—30 **1 Claim**



1. A method of operating a reactor having an active portion of a given length between a charging end and a discharging end, a first end region of the reactor extending from the charging end for one-fourth to one-third of said given length, a second end region extending from the discharging end for one-fourth to one-third of said given length, and a middle region extending between said end regions, said method comprising the steps of inserting end to end in the active region through the charging end a first group of bodies filling the middle region and a second group of bodies filling the first end region, irradiating the first and second groups of bodies while in the middle and first end regions, removing the first group from the reactor through the second end region, shifting the second group through the middle region to the second end region, inserting new first and second groups of bodies through the charging face into the middle and first end regions of the reactor, respectively, and irradiating the original second group and the new first and second groups while in the second end, middle, and first end regions, respectively, removing the original second group and the new first group from the reactor through the second end region, shifting the new second group through the middle region to the second end region, and irradiating the new second group again, whereby the first groups of bodies are irradiated only once and the second groups are irradiated twice.

3,959,071

METHOD AND APPARATUS FOR A NUCLEAR REACTOR FOR INCREASING RELIABILITY TO SCRAM CONTROL ELEMENTS

Frank Bevilacqua, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 28, 1974, Ser. No. 473,606
Int. Cl.² G21C *7/08*
U.S. Cl. 176—36 R **19 Claims**

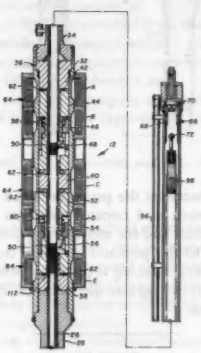
1. A method of increasing reliability of a portion of control elements to scram in a nuclear reactor when the control elements are held in a raised position by linear drive devices associated therewith, the method comprising:

providing each of said linear drive devices with a first holding means actuable to hold said control elements associated therewith in a raised position and deactuable to release said control elements from holding engagement thereby;

providing each of said linear drive devices with a second holding means actuable to hold said control elements in a raised position and deactuable to release said control elements from holding engagement thereby, each of said second holding means being dissimilar and operatively dissimilar from said first holding means;

operating a first portion of said linear drive devices to hold said control elements in a raised position only by said first holding means; and operating the remaining portion of said linear drive devices to hold said control elements in a raised position only by said second holding means.

14. In a magnetic jacking type control element drive assembly having a housing, a control element extension within said housing having a plurality of axially spaced teeth thereon, first engaging means adapted to be moved into and out of engagement with said teeth on said control element extension, and first moving means for moving said first engaging means into an out of engagement with said teeth on said control element extension and for moving said first engaging means longitudinally within said housing to effect stepwise linear motion of said control element extension, said first moving means being adapted to move said first engaging means out of engagement with said teeth on said control element extension in the event of a scram situation to release said control element extension, the improvement comprising: a second holding means for holding said control element extension in a raised position within said housing, said second holding means being mounted on said housing and being independent and different from said first engaging means and said first moving means, said second holding means being operative when in an actuated state to hold said control element extension at least when said first engaging means is out of engagement with said teeth on said control element extension and when in a deactuated state to release said control element extension to permit it to freely fall within said housing, said second holding means being deactuable in the event of a scram situation.



3,959,072

COMPACTABLE CONTROL ELEMENT ASSEMBLY FOR A NUCLEAR REACTOR

Clive Frederick George Dupen, San Diego, Calif., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Sept. 27, 1973, Ser. No. 401,483
Int. Cl.² G21C *7/08*
U.S. Cl. 176—36 R **19 Claims**

1. In a nuclear reactor, the combination comprising:

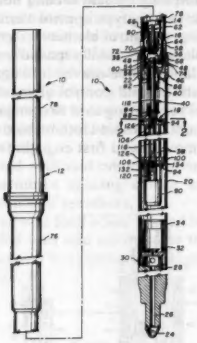
a longitudinally extending duct positionable within the core of the nuclear reactor;

a control element support member longitudinally movable within said duct;

a plurality of parallel, longitudinally extending control elements supported by said support member for longitudinal

movement therewith within said duct, said elements being positioned to provide at least a predetermined minimum lateral spacing between said control elements and the interior wall of said duct; and

means responsive to longitudinal movement in one direction of said support member for moving said control



elements to increase the predetermined minimum lateral spacing between said control elements and the interior wall of said duct and for moving said control elements to return them to the position in which the predetermined minimum lateral spacing is provided when the longitudinal movement in said one direction of said support member is stopped.

3,959,073

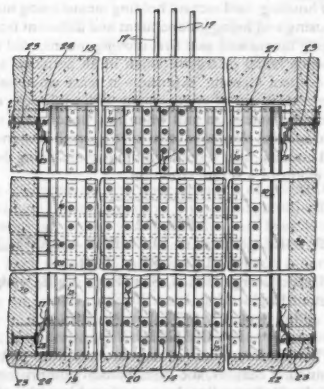
REACTOR HOLD-DOWN ARRANGEMENT

Ralph McCugh, Whitehall, Pa., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 6, 1973, Ser. No. 361,900

Int. Cl.[2] G21C *5/08*

U.S. Cl. 176—85 **1 Claim**



1. In combination with a neutronic reactor containing an assembly of moderator blocks laid end-to-end, one on top of another, and alongside one another, and having passageways for safety rods projecting through the moderator blocks, an apparatus for restraining said assembly of moderator blocks comprising vertical beams positioned at each side of said assembly, an upper and a lower set of fixed horizontal beams surrounding the vertical beams at the tops and bottoms respectively thereof, and partially yielding means acting between the fixed horizontal beams and the ends of the vertical beams, said partially yielding means comprising spring elements divided into four groups, the first group being fastened to the lower fixed horizontal beams and extending upwardly and inwardly toward the vertical beams, the second group being fastened to the lower ends of the vertical beams and extending outwardly toward the lower fixed horizontal beams and downwardly into sliding contact with the first group, the third group being fastened to the upper fixed horizontal beams and extending downwardly and inwardly toward the vertical beams and the fourth group being fastened to the upper ends of the vertical beams and extending outwardly toward the upper fixed horizontal beams and upwardly into sliding contact with the third group.

3,959,074

VACCINE PRODUCTION

William J. Miller, North Wales; Raymond E. Spier, Lansdale, and William J. McAleer, Ambler, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 262,829, June 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 232,211, March 6, 1972, abandoned. This application Dec. 6, 1974, Ser. No. 530,109

Int. Cl.[2] A61K *39/12, 39/20;* C12B *1/00;* C12K *7/00*

U.S. Cl. 195—1.1 **4 Claims**

1. In a process for the controlled manufacture of vaccines wherein cells are grown in a glucose containing nutrient medium and infected with a virus, isocitric dehydrogenase is released from the cells, the improvement which comprises harvesting the virus when the increase of concentration of isocitric dehydrogenase undergoes a maximum rate of change whereby production of the virus is optimized, thereby resulting in greatly increased yields and substantially decreased production costs.

3. A process for the controlled manufacture of human and animal vaccines on an industrial scale whereby the production cycle is optimized, thereby resulting in greatly increased yields and substantially decreased production costs, which comprises charging a cell propagator with cells and a nutrient containing fluid in which glucose is present in a concentration of about 100–150 mg/100 cc of the nutrient medium and operating said propagator to cause growth and propagation of said cells, during operation of said cell propagator performing real time assays to monitor glucose concentration in the nutrient medium, and, when the thus monitored glucose concentration reaches about 20–60 mg/100 cc of the nutrient medium, infecting the cell sheet with a virus capable of effecting the release from said cells, isocitricdehydrogenase, maintaining conditions in said propagator to propagate said virus and, during propagation of said virus, performing real time assays to monitor said enzyme concentration in the propagator and harvesting the resulting vaccine when the monitored enzyme concentration undergoes a maximum rate of change.

3,959,075

PROCESS FOR THE PRODUCTION OF L-LYSINE

Keiichi Inuzuka, and Shinichiro Hamada, both of Hofu, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed July 15, 1975, Ser. No. 595,999

Claims priority, application Japan, July 17, 1974, 49-81142

Int. Cl.[2] C12D *13/06*

U.S. Cl. 195—29 **11 Claims**

1. In a process for producing L-lysine by culturing an L-lysine-producing mutant of coryneform glutamic acid-producing bacteria in a nutrient medium, the improvement which comprises culturing said mutant in a first nutrient medium comprising assimilable carbon and nitrogen sources and an effective amount of culture liquor obtained from culturing an

L-leucine-producing mutant of coryneform glutamic acid-producing bacteria in a second nutrient medium, and thereafter recovering said L-lysine.

3,959,076

PROCESS FOR PRODUCING 2-KETO-L-GULONIC ACID

Takayasu Sonoyama, Sakai; Hiroyoshi Tani, Moriguchi; Bunji Kageyama, Nagaokakyo; Kobee Kobayashi, Nishinomiya; Tahiko Honjo, Minoo, and Shigeo Yagi, Takatsuki, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Mar. 21, 1975, Ser. No. 560,885

Claims priority, application Japan, Sept. 20, 1974, 49-109316

Int. Cl.² C12D 1/02

U.S. Cl. 195—30 11 Claims

1. A process for producing 2-keto-L-gulonic acid or a salt thereof which comprises cultivating a 2-Keto-L-gulonic acid producing microorganism selected from the group consisting of the genus Corynebacterium, and mutants thereof, in an aqueous nutrient medium in the presence of 2,5-diketo-D-gluconic acid or salts thereof, and recovering the produced 2-keto-D-gulonic acid or salts thereof from the resultant mixture.

3,959,077

ENZYME PREPARATION FOR SERUM CARDIAC GLYCOSIDE ASSAY

Gary Brooker, Los Angeles, Calif., assignor to The University of Southern California, Los Angeles, Calif.

Division of Ser. No. 102,719, Dec. 30, 1970, Pat. No. 3,769,414. This application Aug. 11, 1972, Ser. No. 279,817

Int. Cl.² G01N 31/14; C07G 7/02

U.S. Cl. 195—63 13 Claims

1. A binding enzyme precursor for an enzymatic binding radioisotope displacement assay for cardiac glycosides in serum, said binding enzyme precursor produced by the process comprising the following steps: homogenizing animal tissue sensitive to cardiac glycosides in an aqueous osmotic solution to produce a homogenate containing a solid phase and a liquid phase, said tissue having Na-K-ATPase activity; separating the solid phase from the liquid phase; at last once homogenizing said solid phase in an aqueous buffered solution to produce a homogenate containing a solid phase and liquid phase and separating said solid phase from the liquid phase to obtain a binding enzyme preparation; reacting the binding enzyme preparation with calcium in an aqueous buffered solution having a pH of between about 6 and 9 to yield the binding enzyme precursor, at least 0.01 millimole of calcium being used for each gram of tissue used in the preparation.

3,959,078

ENZYME IMMOBILIZATION WITH A THERMOCHEMICAL-PHOTOCHEMICAL BIFUNCTIONAL AGENT

Patrick E. Guire, Kansas City, Mo., assignor to Midwest Research Institute, Kansas City, Mo.

Filed May 18, 1973, Ser. No. 361,545

Int. Cl.² C07G 7/02

U.S. Cl. 195—63 22 Claims

1. A process for immobilization of an active enzyme on a solid support material which comprises:

a. thermochemically attaching to a solid support material an aryl azide bifunctional agent initially possessing both a thermochemically active functional substituent and a photochemically active functional substituent;

b. photochemically activating the azide substituent of the product of step (a); and

c. reacting the photoactivated azide substituent of the product of step (b) with an enzyme to form a covalent linkage therewith.

3,959,079

INSOLUBILIZATION OF PROTEINS BY CHEMICAL ACTIVATION OF A POLYMERIZED SUPPORT AND CROSSLINKING OF THE PROTEIN TO THE SUPPORT

Jean-Pierre Mareschi, Paris; Suzanne Sebesi, Grenoble, and Emile Braye, Autorive, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude and Orsan, les Produits Organiques du Santerre, both of Paris, France

Filed June 21, 1974, Ser. No. 481,750

Claims priority, application France, June 21, 1973, 73.22627

Int. Cl.² C12K 1/00

U.S. Cl. 195—63 18 Claims

1. A process for rendering a protein insoluble in aqueous media, in which the protein is bonded to a chemically-activated, water-insoluble polymeric support by means of an intermolecular bridging agent, which process comprises

halogenating and aminating a polymer of cellulose or its derivative containing free hydroxyl or carboxyl groups in an organic solvent by means of

a halogenating reagent is selected from the group consisting of thionyl halides, sulphuryl halides, phosphorous trihalides and pentahalides, phosphorous oxyhalides and the halides of p-toluene sulphoxide and

a bifunctional aminating reagent selected from the group consisting of compounds represented by the formulae

$$NH_2—NH_2,\ NH_2—R_1—NH_2 \text{ and } \underset{R_2}{NH}—R_1—\underset{R_3}{NH}$$

in which R_1 is one of an alkyl radical containing at most twenty carbon atoms of which at least one is substituted by a group consisting of a phenyl nucleus and the hydroxyalkyl radicals containing at most 20 carbon atoms, and in which R_2 and R_3, which mutually may be the same or different, is one of a lower alkyl radical and a phenyl nucleus

to obtain thereby said chemically-activated, waterinsoluble polymeric support; and bringing the resultant support into contact with the protein which is to be rendered insoluble and then adding thereto the intermolecular bridging agent.

3,959,080

CARRIER MATRIX FOR THE FIXATION OF BIOCHEMICALLY EFFECTIVE SUBSTANCES AND PROCESS FOR THE PREPARATION THEREOF

Hans Dieter Orth; Wolfgang Brummer; Michael Klockow, and Norbert Hennrich, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Sept. 26, 1973, Ser. No. 400,898

Claims priority, application Germany, Sept. 26, 1972, 2247163

Int. Cl.² C07G 7/02, 17/00

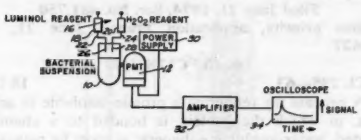
U.S. Cl. 195—63 26 Claims

1. A water-insoluble, partially covalently cross-linked carboxymethylcellulose hydrazide derivative having a swelling capacity, measured as water absorption per gram of dry material, of 10–80 ml. H_2O/g., an average of about 150–2,000 glucose units per molecule and containing about 2–4.5 meq. of acid hydrazide groups per gram of dry material, wherein at least 10% of said hydrazide groups are cross-linked by —CO—NH—Z—Y—Z'—NH—CO— groups wherein Y is a single covalent bond or a linear divalent alkylene chain of 1–18 carbon atoms interrupted by 0–4 oxygen atoms, Z and Z' are each a single covalent bond, —N=CH—, —$NHCH_2$—, —$NHCH_2CHOH$—, —NHCO—, —NH—CO—NH— or —N-H—CS—NH—.

3,959,081
RAPID IDENTIFICATION OF BACTERIA USING CHEMILUMINESCENCE

Samuel Witz, and Walter H. Hartung, both of Los Angeles, Calif., assignors to Akzona Incorporated, Asheville, N.C.

Filed Mar. 26, 1975, Ser. No. 562,068
Int. Cl.² C12K 1/04
U.S. Cl. 195—103.5 R **10 Claims**



1. A method of identifying an individual heme-containing microorganism species, utilizing luminol and hydrogen peroxide as reagents, said method comprising:

a. bringing the luminol and hydrogen peroxide together in the presence of a suspension of the microorganism species to be identified and thereby causing a light emission;

b. recording the light emission including at least a portion of the light build-up and decay to thus provide a characteristic time curve;

c. comparing the characteristic time curve obtained in step (b) with known time curves for said individual microorganism species;

d. whereby the record of said characteristic curve is indicative of the microorganism species of the suspension.

3,959,082
METHOD OF OPERATING A BATTERY OF COKE OVENS

Nicolaas Josephus Willibrordus Thyssen, Haarlem, Netherlands, assignor to Hoogovens Ijmuiden B.V., IJmuiden, Netherlands

Filed Nov. 12, 1973, Ser. No. 414,989
Claims priority, application Germany, Nov. 13, 1972, 2255500
Int. Cl.² C10B 47/00, 49/00, 51/00, 53/00
U.S. Cl. 201—1 **5 Claims**

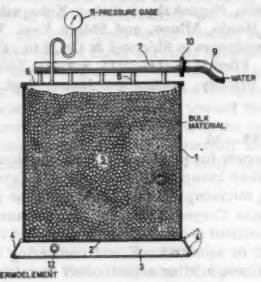
1. In a method of operating a battery of coke ovens having regenerators with checkerwork arranged beneath the oven chambers associated therewith comprising maintaining a constant flow of gas through the battery of coke ovens, measuring a temperature and controlling the on/off ratio of the burners in the heating chambers responsive to said measured temperature so as to maintain said temperature substantially constant, the improvement comprising, measuring said temperature in the upper part of the checker work in the regenerators at a plurality of spaced points in a row substantially parallel to and spaced from the coke side of the ovens.

3,959,083
METHOD AND APPARATUS FOR QUENCHING OF HEATED BULK MATERIALS

Franz Goedde, Aachen, and Heinz Hoeller, Siersdorf, both of Germany, assignors to Eschweiler Bergwerks-Verein Aktiengesellschaft, Herzogenrath-Kohlscheid, Germany

Filed Apr. 11, 1974, Ser. No. 460,073
Claims priority, application Germany, Apr. 19, 1973, 2320057
Int. Cl.² C10B 39/00, 47/00, 49/00
U.S. Cl. 201—39 **11 Claims**

1. A method for quenching heated bulk material coke, comprising filling the bulk material into a container so that the depth of the bulk material is uniform throughout the body of the bulk material on a substantially horizontal, perforated support, closing off the sides and top of the container in a pressure tight manner to seal the bulk material against the atmosphere, supplying the quenching liquid at room temperature uniformly only over the top surface of the bulk material in a multitude of substantially downwardly directed parallel pressurized sprays, whereby the liquid and the vapor developed by the quenching, flow in parallel current fashion downwardly throughout the body of the bulk material, maintaining the quenching liquid supply for about 45 to 90 seconds until the vapor temperature has been cooled down to 400°C at

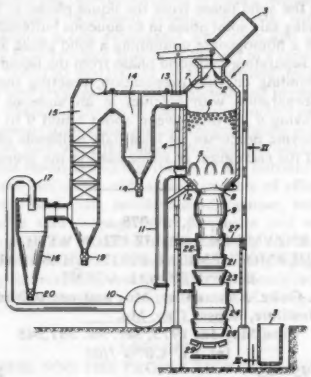


most, or a temperature lower than 400°C and limiting the quenching liquid quantity as a function of the bulk material so that the range of liquid consumption is about 320 to 460 liters per ton of coke so that it evaporates substantially completely except for a small remainder retained as its moisture content by the bulk material, and keeping said remainder moisture content below 2% of the quantity of quenching liquid supplied to the top of said bulk material.

3,959,084
PROCESS FOR COOLING OF COKE

John Gordon Price, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Sept. 25, 1974, Ser. No. 509,079
Int. Cl.² C10B 39/00
U.S. Cl. 201—39 **3 Claims**



1. The method of cooling coke from incandescent temperature to a temperature where it may be transported in open air on a conveyor belt which comprises initially reducing the temperature from said incandescent temperature to a range between 600°F and 800°F by inert gas circulating therethrough in a first enclosure and thereafter immediately cooling it in a second enclosure by direct transfer of heat from the coke to water where the latent heat of vaporization of the water as liquid to steam effects the primary reduction of temperature of the coke from the range of 600°F to 800°F to a

temperature between about 200°–300°F, below the temperature where steam and hot coke react, and excluding steam so produced from said first enclosure.

3,959,085

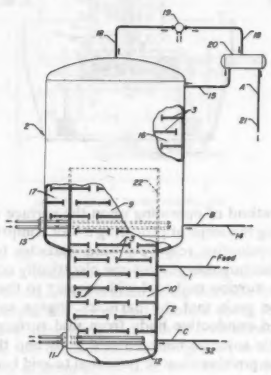
FRACTIONATION APPARATUS HAVING TWO INTEGRAL AND CONCENTRIC FRACTIONATING UNITS

Richard R. De Graff, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation of Ser. No. 320,247, Jan. 2, 1973, Pat. No. 3,844,898. This application June 6, 1974, Ser. No. 476,984 The portion of the term of this patent subsequent to Oct. 29, 1991, has been disclaimed.

Int. Cl.² B01D *3/26*

U.S. Cl. 202—154 **3 Claims**



1. A fractionating apparatus capable of producing three pure component streams which comprises:

a. a lower first, and an upper, second fractionation unit, each of the units being cylindrical in cross-sectional configuration, each of the fractionation units having an upper rectification section and a lower stripping section, the rectification section of the lower first unit being of less diameter than the second unit and extending upward into the second unit a substantial distance, thereby forming an annular chamber, said chamber having therein a series of fractionation trays extending between said first and second units;

b. means to introduce a feed stream to the apparatus at a point located between the top and bottom of the lower first fractionation unit;

c. reboiler means located near the bottom of the stripping section of each of the fractionation units;

d. means to provide external reflux to the rectification section of the upper fractionation unit;

e. means to remove a product stream from the bottom of each of the stripping sections; and,

f. means to remove a product stream from the top of the rectification section of the upper fractionation unit.

3,959,086

MULTI-INLET HOPPER ARRANGEMENT FOR FILLING SUCCESSIVE ONES OF A BATTERY OF FURNACE CHAMBERS

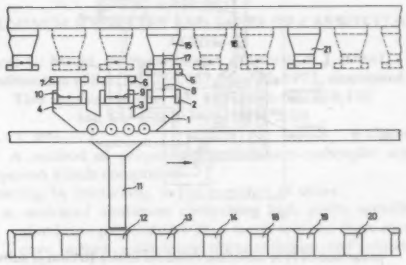
Manfred Galow, and Heinz Osterberg, both of Essen, Germany, assignors to Bergwerksverband GmbH and Didier Engineering GmbH, both of Essen, Germany

Filed July 16, 1974, Ser. No. 491,433

Claims priority, application Germany, July 18, 1973, 2336515

Int. Cl.² C10B *31/02*

U.S. Cl. 202—262 **8 Claims**



1. In an apparatus for successively supplying coal to filling inlets of a battery of coke oven chambers, which filling inlets are arranged in at least one row and spaced a predetermined distance from one another in a longitudinal direction of the row, a combination comprising a filling arrangement above the battery and including a plurality of inlet units which are spaced by said distance in said direction, at least one filling unit above the row, a closed hopper connecting and communicating said inlet units with said filling unit, and a plurality of closing means for selectively closing said inlet units; a coal conveyor extending in said direction above said filling arrangement and having a plurality of outlet units which are spaced a multiple of said distance in said direction; and means for mounting said filling arrangement for movement in said direction to a plurality of filling positions in each of which said filling unit is aligned and communicates with a respective filling inlet said filling arrangement being so configurated that in each of said filling positions thereof one inlet unit is aligned with one outlet unit of said conveyor, each inlet unit including sealing means for establishing a gas-tight and dust-tight registration between such inlet unit and an outlet unit of the conveyor when such inlet unit and outlet unit are aligned, said closing means of only the aligned inlet unit being open to establish direct communication of said one outlet unit of said conveyor with the respective filling inlet of the battery, whereby coal discharged by said one outlet unit passes into the aligned inlet unit without escaping into the ambient environment and then falls through the filling arrangement and is discharged into one of the filling inlets of the battery.

3,959,087

IN-LINE RESIDUAL CHLORINE ANALYZER

James J. Morrow, Norristown, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Continuation of Ser. No. 855,619, Sept. 5, 1969, abandoned. This application Apr. 17, 1974, Ser. No. 461,810

Int. Cl.² G01N *27/46*

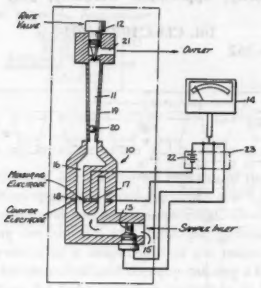
U.S. Cl. 204—1 T **3 Claims**

1. The method of testing the free chlorine content of a chlorinated water supply without the use of buffering agents, said method comprising the steps:

A. deriving a sample stream from the water supply and passing it through the passage between spaced copper measuring and counterelectrodes of an amperometric cell

whereby the electrodes make electrical contact with the sample stream;

B. applying across the electrodes of the cell a direct voltage in a polarity which renders the measuring electrode negative relative to the counterelectrode and with a potential level causing the cell to operate in a saturation voltage zone in which a limiting current flow produced by the



presence of free chlorine residual in the stream is substantially proportional to the concentration thereof and is substantially independent of changes in voltage in said zone; and

C. indicating the intensity of said current to provide a reading of the concentration of free chlorine residual in said supply.

3,959,088

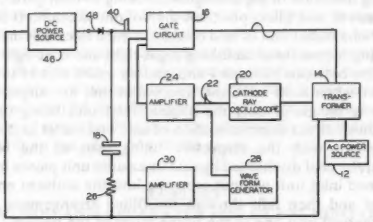
METHOD AND APPARATUS FOR GENERATING HIGH AMPERAGE PULSES FROM AN A-C POWER SOURCE

William C. Sullivan, Watervliet, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 19, 1975, Ser. No. 559,952

Int. Cl.² C25D *1/00*

U.S. Cl. 204—14 R **9 Claims**



1. A method for increasing the density and rate of deposit in the electroplating of metals, comprising the steps of,

synchronizing the delay sweep of a cathode ray oscilloscope with the sine wave of an a-c voltage input thereto,

varying the speed of the delay sweep of the oscilloscope relative to that of the main sweep thereof to produce successive output triggers at a selected frequency of repetition,

adjusting the timing of the delay sweep relative to the main sweep to originate each output trigger at the particular point along the positive half cycle of the a-c sine wave input at which the voltage of such trigger will attain a desired magnitude, and

amplifying each output trigger to function a rectifier gate circuit for supplying an electroplating cell with d-c pulses of predetermined duration at amperages and frequencies corresponding to the adjustments to the oscilloscope.

3,959,089

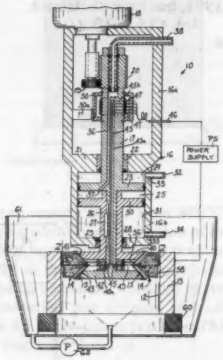
SURFACE FINISHING AND PLATING METHOD

John D. Watts, 2 Mohawk Drive, Clinton, Conn. 06413

Division of Ser. No. 276,882, July 31, 1972, Pat. No. 3,871,983. This application Dec. 30, 1974, Ser. No. 537,079

Int. Cl.² C25D *7/04*, *5/44*

U.S. Cl. 204—26 **7 Claims**



1. A method of operating upon the surface of a workpiece comprising the steps of providing a tool comprising a plurality of non-conductive relatively hard particles bound and uniformly distributed in at least one electrically conductive body, relatively moving said tool with respect to the surface of the workpiece such that the particles engage said surface and space said conductive body from said surface, supplying an electrolytic solution between said body and the surface, and applying a positive electric potential to said body with respect to an electrical potential applied to the workpiece.

3,959,090

CONTINUOUS ELECTROLYTE COLORING OF A PRE-ANODISED ALUMINUM FOIL OR STRIP

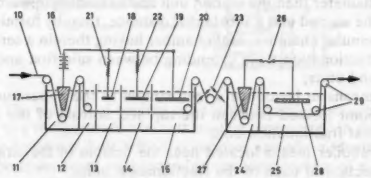
Gunter Hollrigl, Schaffhausen, and Ladislav Sandera, Neuhausen am Rheinfall, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed July 28, 1975, Ser. No. 599,393

Claims priority, application Switzerland, July 31, 1974, 10561/74

Int. Cl.² C25D *11/22*

U.S. Cl. 204—28 **13 Claims**



1. A continuous process for anodic oxidation of an aluminum strip or foil to form an oxide layer and subsequent electrolytic coloring of the oxide layer by means of alternating current, said process comprising the steps of:

subsequent to the anodic oxidation, passing said aluminum through an aqueous contacting electrolyte;

thereafter, passing said aluminum through an aqueous coloring electrolyte comprising metal ions, said contact and coloring electrolytes being separated from each other;

disposing a first inert electrode in said contacting electrolyte;

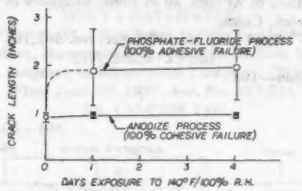
disposing at least a second inert electrode in said coloring electrolyte; and

applying an alternating current to said first and second electrodes to precipitate said metal ions without any direct physical contact with said aluminum, the potential difference between said first electrode and said aluminum being less than the potential difference between said aluminum and said second electrode.

3,959,091
METHOD OF ANODIZING TITANIUM TO PROMOTE ADHESION

Yukimori Moji, Bainbridge Island, and J. Arthur Marceau, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 14, 1973, Ser. No. 424,792
Int. Cl.² C25D 11/18, 11/34
U.S. Cl. 204—38 A **28 Claims**

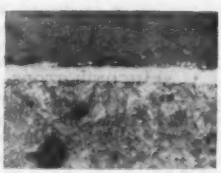

CRACK LENGTH (INCHES)
PHOSPHATE-FLUORIDE PROCESS (100% ADHESIVE FAILURE)
ANODIZE PROCESS (100% COHESIVE FAILURE)
DAYS EXPOSURE TO 140°F/100% R.H.

1. A method of forming a porous, adhesion-promoting, oxide coating on a titanium article comprising anodizing said article in an aqueous solution comprising fluoride ions and an oxidizing electrolyte, the pH of said solution being less than 6, the anodizing potential being from about 5 to about 40 volts, and the fluoride ion concentration being such as to result in a current density of from about 0.25 to about 5 amperes per square foot.

3,959,092
METHOD FOR A SURFACE TREATMENT OF CEMENTED CARBIDE ARTICLE

Noboru Komatsu, Toyoake; Tohru Arai, and Yoshihiko Sugimoto, both of Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya, Japan

Filed Nov. 13, 1973, Ser. No. 415,393
Claims priority, application Japan, Nov. 16, 1972, 47-114290
Int. Cl.² C25D 11/00
U.S. Cl. 204—39 **17 Claims**



(X 400)

1. A method for forming a hard layer containing at least one member selected from the group consisting of chromium carbide and chromium boride on the surface of a cemented carbide article containing at least 0.05% by weight of carbon, which comprises preparing a molten bath containing molten boron oxide and a substance containing chromium, immersing the article into the molten bath contained in a vessel, applying an electric current to the molten bath through said article as a cathode so as to deposit a member selected from the group consisting of (1) chromium and (2) a mixture of chromium and boron, on the surface of the article and form a hard layer containing at least one member selected from the group consisting of chromium carbide and chromium boride on the surface of said article, and removing the resultant article from the molten bath.

3,959,093
ALUMINUM HYDRATES AND SALTS OF CARBOXYLIC ACIDS

George G. Merkl, 46 Sunset Court, Haworth, N.J. 07641

Continuation of Ser. No. 255,757, May 22, 1972, abandoned. This application May 13, 1974, Ser. No. 469,126
Int. Cl.² C25B 3/00; C07F 5/06
U.S. Cl. 204—72 **6 Claims**

1. A method of preparing an aluminum-carboxylic acid compound which comprises:

reacting by contacting, in the presence of water:

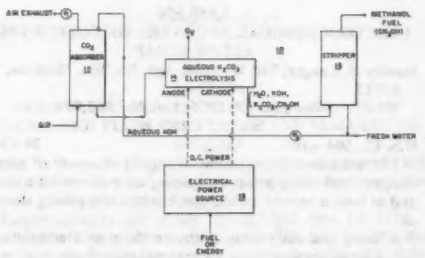
a. activated aluminum comprising high purity metallic aluminum permeated with a metal selected from mercury, indium, gallium and alloys of indium and gallium; with

b. a carboxylic acid selected from acetic acid, ascorbic acid and citric acid; whereby the aluminum of said activated aluminum is consumed in reaction with said carboxylic acid, thereby forming said aluminum-carboxylic acid compound.

3,959,094
ELECTROLYTIC SYNTHESIS OF METHANOL FROM CO_2

Meyer Steinberg, Huntington Station, N.Y., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 13, 1975, Ser. No. 558,188
Int. Cl.² C25B 3/04; C07C 31/06
U.S. Cl. 204—77 **2 Claims**



1. The method of synthesizing CH_3OH comprising the steps of:

a. passing air containing CO_2 into contact with an aqueous solution of KOH in an absorber to cause absorption of CO_2 from the air by said KOH producing an aqueous solution containing K_2CO_3;

b. passing the solution of K_2CO_3 through an electrolytic cell having an anode and cathode wherein a D. C. potential is applied to cause electrolysis of the carbonate, methanol being produced at said cathode, and KOH and O_2 being formed at said anode, said O_2 being released;

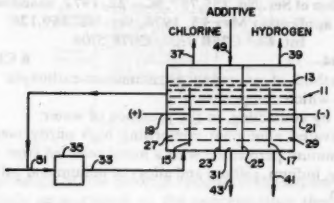
c. passing the aqueous solution of CH_3OH and KOH also containing K_2CO_3 out of said cell followed by removing the CH_3OH from said solution; and
d. adding make-up water to the remaining solution and returning same to said absorber.

3,959,095

METHOD OF OPERATING A THREE COMPARTMENT ELECTROLYTIC CELL FOR THE PRODUCTION OF ALKALI METAL HYDROXIDES

Gerald R. Marks, Youngstown, and Blaine O. Schoepfle, Snyder, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Jan. 31, 1975, Ser. No. 545,858
Int. Cl.² C25B *1/16, 1/26*
U.S. Cl. 204—98 **12 Claims**



1. In the method of manufacturing an alkali metal hydroxide by the electrolysis of an aqueous salt solution containing halide ions in an electrolytic cell having at least three compartments therein, an anode positioned in the anode compartment, a cathode positioned in the cathode compartment, at least two cation-active permselective membranes of a polymeric material defining anode and cathode side walls of a buffer compartment between anode and cathode compartments, and such walls, with walls thereabout, defining anode and cathode compartments wherein the improvement comprises:

mixing the solution in the buffer compartment while electrolyzing the salt solution in said electrolytic cell so as to produce an alkali metal hydroxide solution in said buffer compartment of essentially uniform concentration.

3,959,096

ELECTROCHEMICAL RECOVERY OF COPPER FROM ALLOY SCRAP

Stanley H. Langer, 746 W. Main, Apt. No. 302, Madison, Wis. 53715

Filed Jan. 17, 1975, Ser. No. 542,079
Int. Cl.² C25C *1/12*
U.S. Cl. 204—107 **20 Claims**

14. A method for hydrometallurgical recovery of metallic copper from alloy scrap containing alloyed metallic copper and at least a second metal, said method comprising the steps of:

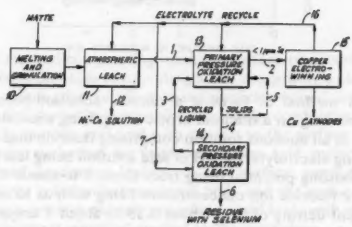
a. using said alloy scrap as the anode in an electrolytic cell containing a cathode, an external electrical circuit means for connecting said cathode to the resulting alloy scrap anode, and an aqueous electrolyte in contact with both said alloy scrap anode and said cathode, said aqueous electrolyte being maintained substantially free of dissolved oxygen gas, having a pH less than about 7, and being about 1.0–14 molar with respect to water soluble ammonium halide or a halide salt of a metal which is more electropositive than copper;
b. electrochemically converting alloyed copper in said alloy scrap, at said alloy scrap anode, into water soluble complex ions containing copper in the cuprous state, whereby said copper in said alloy scrap is introduced into said aqueous electrolyte as said water soluble complex ions through the action of electrodissolution, said converting step being accompanied by the transfer, from said alloyed metallic copper to said electrical circuit means, of about 1.0 faraday of electricity for each gram atom of copper converted to said complex ion;
c. preventing access of oxygen gas to said aqueous electrolyte during said step (b), whereby the copper in said cuprous state in said complex ions is maintained in said cuprous state;
d. circulating said water soluble complex ions produced in step (b) by agitation of said aqueous electrolyte to provide continual motion of aqueous electrolyte containing said water soluble complex ions at least in the region of said electrolyte surrounding said cathode and said anode;
e. electrochemically converting copper-containing ions resulting from step (b) to substantially pure metallic copper at said cathode by consuming about 1.0 faraday of electricity for each gram atom of copper obtained; and
f. recovering the substantially pure metallic copper obtained by said step (e).

3,959,097

SELENIUM REJECTION DURING ACID LEACHING OF MATTE

Paul B. Queneau, Golden; Raymond D. Symens, and Eddie C. Chou, both of Arvada, all of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed May 30, 1975, Ser. No. 582,101
Int. Cl.² C25C *1/12*
U.S. Cl. 204—108 **7 Claims**



1. A method for removing trace amounts of selenium from an acid leach solution containing over 2 ppm of total selenium which comprises,

forming a slurry of said acid solution with comminuted metal sulfide concentrate,
said slurry containing at least about 2 grams of a metal ion as insoluble metal hydroxide per liter of acid solution,
and then subjecting said slurry to pressure oxidation while agitating said slurry at a temperature of at least about 185°C at a pressure of at least about 160 psig,
whereby to reduce the total selenium content of said solution to less than 2 ppm total Se.

3,959,098

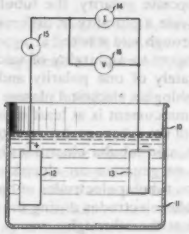
ELECTROLYTIC ETCHING OF III - V COMPOUND SEMICONDUCTORS

Bertram Schwartz, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 12, 1973, Ser. No. 340,046
Int. Cl.² C25F *3/14*
U.S. Cl. 204—129.3 **8 Claims**

1. A method of etching a III-V compound semiconductor comprising making the semiconductor the anode in an electrolytic cell wherein the electrolyte consists essentially of water and HNO_3 wherein the normality of the electrolyte is within the range .01 – 1.0, and passing a current through said cell until a desired etch is reached.

6. A method of etching a III-V compound semiconductor comprising making the semiconductor the anode in an electrolytic cell wherein the electrolyte consists essentially of



water and HCl wherein the normality lies within the range .01 – 1.0, and passing a current through said cell until a desired etch is reached.

3,959,099

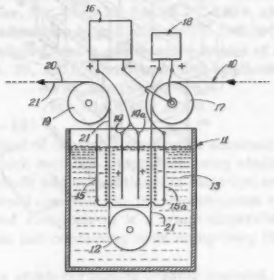
ELECTROLYTIC METHOD OF PRODUCING ONE-SIDE-ONLY COATED STEEL

Griff W. Froman, St. John; Brian A. Sok, East Chicago; Lenin F. Martinez, Hammond, and Albert R. Mullins, Portage, all of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed June 18, 1975, Ser. No. 587,816

Int. Cl.² C25F 5/00

U.S. Cl. 204—146 **8 Claims**



1. In a method of making a one-side-only coated endless metal sheet material in which the sheet has initially a protective metal coating on both lateral surfaces thereof and is subjected to an electrolytic treatment which removes the protective metal coating from only one side of the metal sheet, the improvement comprising: continuously passing the metal sheet having said protective metal coating on both lateral surfaces thereof through an electrolytic treating chamber containing an electrolyte bath selected from the group consisting of (1) a strongly acidic aqueous solution having a pH from about pH 0.1 to 2.0 and (2) a strongly alkaline aqueous solution having a pH of at least about pH 11, said metal sheet being guided between spaced anodic and cathodic electrodes immersed in said electrolyte bath, said anodic electrode being disposed adjacent the surface of the metal sheet which remains coated with said protective metal and said cathodic electrode being disposed adjacent the surface of the metal sheet from which said protective metal coating is removed, establishing a cathodic current from one source of direct current through said electrolyte bath between said anodic electrode and the surface of said metal sheet closest thereto, establishing an anodic current from a second source of direct current through the electrolyte bath between said cathodic electrode and the surface of said metal sheet closest thereto, maintaining said anodic current at a current density level which maintains the surface of said metal sheet which is to remain coated completely cathodic and effects complete removal of said protective metal coating from the anodic surface during the period said sheet remains in said electrolytic treating chamber, and maintaining the said cathodic current at a current density level below said anodic current density level and at a level sufficient to neutralize the E.M.F. generated when the said protective metal coating is immersed in said electrolyte bath and maintain the surface of said metal sheet from which the protective metal is removed completely anodic; whereby removal of protective metal from said one side of said sheet is prevented while the said protective metal coating on the opposite side of said sheet is completely removed.

3,959,100

PHOTOPOLYMERIZABLE COATING COMPOSITIONS CONTAINING ACTIVATED HALOGENATED AZINE PHOTOINITIATOR AND PROCESS FOR MAKING SAME

Vincent Daniel McGinniss, Valley City, Ohio, assignor to SCM Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 413,830, Nov. 8, 1973, Pat. No. 3,857,769. This application Sept. 23, 1974, Ser. No. 508,126

Int. Cl.² C08F 8/00, 2/46, 4/00

U.S. Cl. 204—159.15 **6 Claims**

1. A photopolymerizable composition consisting essentially of (1) a polymerizable ethylenically unsaturated vehicle selected from the group consisting of monomers, oligomers, prepolymers, and mixtures thereof, (2) from about 1.0 to about 10% by weight based on the weight of the vehicle of an activated halogenated azine photosensitizer selected from the group consisting of activated halogenated benzazines, benzodiazines, diazines, and mixtures thereof, said azine is characterized by having a substituted radical selected from chlorosulfonyl, α-haloalkyl, and α-haloalkylated aryls, and (3) from 0 to about 20% by weight of the vehicle of an opacifying pigment.

3,959,101

IRRADIATED AROMATIC POLYSULPHONES OF INCREASED FLOW RESISTANCE AND MOLECULAR WEIGHT

Philip Anthony Staniland, Welwyn, and Graham Jarrett, Hitchin, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 207,948, Dec. 14, 1971, abandoned. This application July 23, 1973, Ser. No. 381,382

Claims priority, application United Kingdom, Dec. 22, 1970, 60906/70

Int. Cl.² C08F 1/00, 8/18; C08G 75/00

U.S. Cl. 204—159.11 **17 Claims**

1. An aromatic polymer having increased molecular weight and resistance to flow produced by the exposure to a total dose of 10 to 150 Mrads of ionizing radiation selected from β-ray and γ-ray at temperatures of up to 400°C of at least one aromatic polysulphone containing repeat units —Ar-SO_2— where Ar is a bivalent aromatic residue which may vary from unit to unit in the polymer chain and at least some of the Ar units have an aromatic ether or thioether group in the polymer chain ortho or para to at least one —SO_2— group, followed by heating the irradiated polysulphone to a temperature of 200°C to 400°C.

3,959,102

METHOD FOR PREPARING A CROSSLINKED GRAFT COPOLYMER OF SILICONE AND POLYVINYLPYRROLIDONE FOR USE AS A CONTACT LENS, AND A CONTACT LENS PRODUCED THEREBY

Georges Wajs, Ivry, and William Lenne, Gagny, both of France, assignors to Essilor International (Compagnie Generale d'Optique S.A.), Joinville-le-Pont, France

Division of Ser. No. 417,250, Nov. 19, 1973. This application Oct. 10, 1974, Ser. No. 513,585

Claims priority, application France, Aug. 6, 1973, 73.28665

Int. Cl.[2] C08F *2/46*, *30/08*; G02C *7/04*

U.S. Cl. 204—159.13 8 Claims

1. A method for preparing a contact lens adapted to be worn on the cornea comprising preparing a substrate of generally concavo-convex shape, said substrate consisting essentially of a graft copolymer of about 75 to 99% by weight of a polyorganosiloxane having about 1 to 25% by weight of polyvinylpyrrolidone grafted thereto; and irradiating said substrate to crosslink said polyvinylpyrrolidone units, said irradiating being of sufficient intensity and duration to cause a sufficient amount of crosslinking of said polyvinylpyrrolidone units to substantially reduce the risk of rupture of a pre-corneal lachrymal film, while said graft copolymer remains capable of being rendered transparent and has the optical properties necessary to function as a contact lens.

3,959,103

PHOTOCURING OF UNSATURATED POLYESTER/POLYTHIOL COMPOSITIONS

Donald Wayne Larsen, Marriottsville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 118,526, Feb. 24, 1971, abandoned, which is a continuation-in-part of Ser. No. 827,075, May 22, 1969, abandoned. This application Sept. 17, 1973, Ser. No. 397,521

Int. Cl.[2] C08G *18/00*, *63/00*

U.S. Cl. 204—159.19 8 Claims

1. A process for photocuring unsaturated polar polyesters which comprises:

a. admixing (i) 30 to 95% by weight of a polar polyester containing two or more reactive unsaturated carbon to carbon bonds per molecule at least one of which is situated internally to the main backbone chain, said polyester consistng essentially of the condensation product of carboxylic acids with alcohols (ii) 5 to 70% by weight of an ester thiol having a molecular weight in the range 152 to 20,000 and which contains at least two sulfhydryl groups, the total combined functionality of the reactive unsaturated carbon to carbon bonds per molecule in the polyester and the sulfhydryl groups per molecule in the ester thiol being greater than 4, and (iii) 0.0005 to 10% by weight of a photocuring rate accelerator;

b. exposing said admixture under ambient conditions to radiation having an energy greater than 3.0 electron volts whereby there is an addition of said sulfhydryl groups of said ester thiol to said reactive unsaturated carbon to carbon groups of said polar polyester resulting in a cured product.

3,959,104

ELECTRODE STRUCTURE FOR GENERATING ELECTRICAL DISCHARGE PLASMA

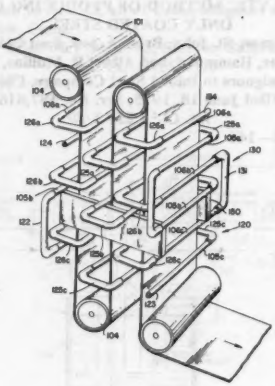
John D. Fales, Huntington Station, N.Y., assignor to Surface Activation Corporation, Westbury, N.Y.

Filed Sept. 30, 1974, Ser. No. 510,692

Int. Cl.[2] B01K *1/00*; C07C *3/24*

U.S. Cl. 204—164 9 Claims

1. A method of treating a moving substrate with an electrical discharge plasma, which comprises passing said substrate along a plurality of different paths of travel through an electrode means comprising at least two electrode structures, each electrode structure comprising at least one row of a plurality of elongated, tubular electrodes, the rows of one electrode structure alternating with the rows of the other electrode structure to form a stacked array of rows transverse to the said paths of travel of said substrate; maintaining the electrode structures at opposite polarity; the tubular electrodes being arranged to provide a plurality of different paths of travel of said substrate through said stacked array; each said path being substantially tangent to a plurality of said tubular electrodes arranged alternately of one polarity and then the opposite polarity; establishing an electrical plasma discharge such that the flow of plasma current is at least substantially parallel to a major surface of the substrate during each said path of travel of said substrate, said tubular electrodes being so arranged as to be operable to generate an electrical plasma discharge between adjacent tubular electrodes of opposite polarity; and cooling the tubular electrodes during the electrical discharge by flowing coolant therethrough.



2. An electrode apparatus for generating electrical discharge plasma for treatment of a moving substrate, comprising at least two electrodes structures of opposite polarity, each electrode structure comprising at least on row of a plurality of elongated, tubular electrodes, the rows of one electrode structure alternating with the rows of the other electrode structure to form a stacked array of rows transverse to the path of travel of said substrate; the tubular electrodes being arranged to provide a plurality of different paths of travel of said substrate through said stacked array; each said path being substantially tangent to a plurality of said tubular electrodes arranged alternately of one polarity and then the opposite polarity; said tubular electrodes being so arranged as to be operable to generate an electrical plasma discharge between adjacent tubular electrodes of opposite polarity such that the flow of plasma current is at least substantially parallel to a major surface of the substrate during each said path of travel of said substrate; and conduit means for providing a path for coolant to flow through the tubular electrodes of an electrode structure.

3,959,105

PROCESS FOR THE PRODUCTION OF HYDROPHILIC SURFACES ON SILICON ELASTOMER ARTICLES

Paul Feneberg, Planegg, and Ulrich Krekeler, Munich, both of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Continuation-in-part of Ser. No. 318,853, Dec. 27, 1972. This application Oct. 22, 1974, Ser. No. 517,096

Claims priority, application Germany, Oct. 25, 1973, 2353495

Int. Cl.² B01K 1/00

U.S. Cl. 204—165 17 Claims

1. A process for the production of hydrophilic surfaces on articles which contain a silicone elastomer and which include silicon dioxide as a filler, comprising subjecting an article having a surface portion which comprises an outer layer of a silicone elastomer to the action of activated gas ions in an atmosphere consisting at least predominantly of oxygen, said gas ions impinging first regions of said outer layer and having an energy such that said outer layer is destroyed at said first regions and the silicon dioxide filler of said article is exposed at said first regions, and said gas ions also impinging second regions of said outer layer and having an energy such that said outer layer transforms to silicon dioxide at said second regions, whereby an improvement in the hydrophilic characteristics of said article is obtained due to the exposure of the silicon dioxide filler at said first regions and the transformation to silicon dioxide at said second regions.

3,959,106

METHOD OF ELECTRODEPOSITING QUATERNARY SULFONIUM GROUP-CONTAINING RESINS

Joseph F. Bosso, Lower Burrell, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 455,428, March 27, 1974, abandoned, which is a continuation-in-part of Ser. No. 292,360, Sept. 26, 1972, abandoned, and a continuation-in-part of Ser. No. 210,141, Dec. 20, 1971, abandoned. This application Jan. 8, 1975, Ser. No. 539,568

Int. Cl.² C25D 13/06

U.S. Cl. 204—181 9 Claims

1. In a method of coating a conductive substrate serving as a cathode, which method comprises passing electric current between an anode and said cathode in electrical contact with a water-dispersed composition, the improvement wherein the water-dispersed composition is a water-dispersible, quaternary sulfonium salt-containing resin comprising the reaction product of:

A. an epoxy group-containing organic material, and

B. a sulfide-acid mixture, said sulfide acid mixture reacted with said organic material in an amount and at a temperature sufficient to provide a quaternary sulfinium salt-containing, water-dispersible resin.

3,959,107

COMBINATION ELECTRODE

Jack Edgar Horner, 1142 Santiago Drive, Newport Beach, Calif. 92660, and Charles Richard Selby, 2801 N. Bristol St., No. 63, Santa Ana, Calif. 92706

Filed June 6, 1974, Ser. No. 477,076

Int. Cl.² G01N 27/36, 27/30

U.S. Cl. 204—195 G 15 Claims

1. In a combination, ion sensitive and reference electrode:

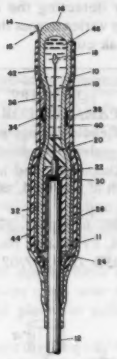
an elongated electrically non-conducting tube, one end of which is fitted with a specific ion permeable seal;

first connection means within said tube for making electrochemical connection to the inner side of said seal;

said tube being formed with a depression in its exterior surface;

means for creating a cavity of the space overlying said depression which can be entered from the exterior of the electrode by a needle comprising a pliant member formed of a substance that may be pierced with a needle from the exterior of the electrode, and carried by said tube and overlying said depression such that said depression forms a cavity between said pliant member and said tube and exposed at the exterior of said electrode;

second connection means comprising a metallic electrical conductor terminating in said cavity;



non-metallic means for conducting ions between the exterior of said combination electrode and said cavity; and

a quantity of salt other than a salt of the metal of said metallic electrical conductor in said cavity in physical contact with said second connection means and with said non-metallic means.

3,959,108

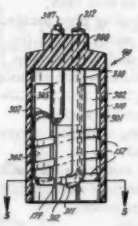
SYSTEM FOR AUTOMATICALLY MEASURING AND CONTROLLING THE SULFATE CONTENT OF A CHROMIUM PLATING SOLUTION

William H. Plumpe, Jr., 11109 Conway Road, St. Louis, Mo. 63131

Continuation of Ser. No. 212,198, Dec. 27, 1971, abandoned. This application May 1, 1974, Ser. No. 465,806

Int. Cl.² G01N 27/46

U.S. Cl. 204—195 R 33 Claims



1. A measuring device for measuring the sulfate content of a chromium plating solution where a relationship exists between the voltage applied to the electrodes immersed in the solution and the current through the electrodes such that as the voltage increases from a prescribed first value, the current between the electrodes increases to a peak and then decreases, the magnitude of the current peak being directly proportional to the sulfate content of the solution, the device comprising spaced electrodes for immersing in the solution, said electrodes including a cathode of thin metallic ribbon, the surface of the cathode being relatively flat and its width dimension being oriented vertically in the solution, and a metallic anode surrounding the cathode, the device further comprising, electrical circuit means electrically connected to the electrodes, means associated with the circuit means for auto-

matically applying a smoothly increasing voltage across the electrodes, means associated with the circuit means for starting the smoothly increasing voltage at a voltage value lower than that which produces the peak current between the electrodes and for continuously increasing the voltage to at least the value producing said peak current, to produce a current variation in the solution between the electrodes that increases to a peak, means for detecting the current variation in the solution as the voltage varies across the electrodes, and means for registering the peak current.

3,959,109

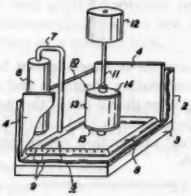
METHOD AND APPARATUS FOR ELECTROFORMING

Peter G. Hambling, Reading, England; Leslie W. Owen, deceased, late of Kingsclere, England; by Elizabeth Bertram Owen, executrix, Kingsclere, and by George Mould, executor, Orpington, both of England, assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 307,699, Nov. 17, 1972. This application Jan. 14, 1974, Ser. No. 432,924

Int. Cl.² C25D *7/00, 17/02, 17/06, 17/10*

U.S. Cl. 204—212 **1 Claim**



1. An apparatus for electroforming comprising:

a. a tank suitable for containing an electroplating bath;

b. an anode and a cathode located in said tank in a position to allow a plating current to pass between said anode and cathode, said cathode being a former onto which a metal coating is electroformed, said cathode being centralized in said tank and located further from said tank walls than said anode, said anode located adjacent said tank walls;

c. means for filtering and circulating said electroplating bath connected to said tank;

d. a closed loop feeding pipe located in said tank between said anode and said cathode for feeding an electrolyte into said tank, said closed loop feeding pipe having a plurality of apertures which are located such that the flow of said electrolyte is directed toward an inward facing surface of said anode surface;

e. means for passing a plating current between said anode and cathode; and

f. means to rotate said cathode such that its surface has a linear velocity through said electroplating bath at least about 30 cm. per second.

3,959,110

APPARATUS FOR SILVER RECOVERY

Kenneth G. Burgess, Derby, N.Y., assignor to Hydrospace Industries, Inc., Buffalo, N.Y.

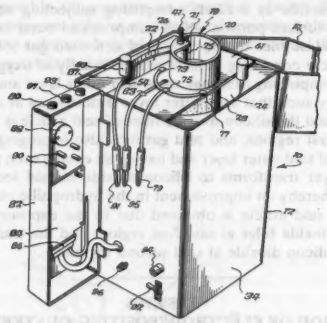
Continuation-in-part of Ser. No. 350,464, April 12, 1973. This application Apr. 8, 1974, Ser. No. 458,465

The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.

Int. Cl.² B65D *69/00;* **A24F** *15/00*

U.S. Cl. 204—229 **15 Claims**

1. An apparatus for recovering silver from a photographic solution which comprises (a) an electrolysis vessel having an electrolysis chamber therein; (b) a carbonaceous anode in said chamber; (c) a metallic cathode in said chamber; (d) a rotary impeller for circulating electrolyte within said chamber into contact with the cathode; (e) a self-triggering siphon for intermittently feeding to the electrolysis chamber a given volume of the photographic solution from which silver is to be recovered; and (f) means responsive to the feedings of a plurality of said measured volumes of feed solution to the chamber, for passing a direct plating current of electricity between said anode and cathode and through a solution of electrolyte in said electrolysis chamber containing said measured volumes of feed solution, in predetermined quantity to plate out silver on the cathode in an amount which is from a substantial proportion to all of the silver recoverable by plating from the plurality of said measured volumes of feed solution fed to the electrolysis chamber, which means is activated by contacts with a plurality of the measured volumes of feed



solution as the feed solution is fed to the electrolysis chamber and which includes electronic means for counting the number of volumetric discharges and actuating means to pass sufficient electricity between the electrodes to plate out the silver from the number of measured volumes of feed solution so fed to the electrolysis chamber, said electronic means for counting the number of volumetric discharges including a sensor connected to electronic circuitry capable of distinguishing between dripping and continuous flowing of feed solutions from the siphon and of initiating electric current flow between the electrodes by means of the actuating means in response to said continuous flows of feed solution from the siphon and not in response to drippings of such solution therefrom.

3,959,111

ELECTROLYTIC CELL

Pierre Mardine, Saint Gratien, and Lucien Allais, Marly-le-Roy, both of France, assignors to Le Nickel, Paris Cedex, France

Filed Aug. 14, 1974, Ser. No. 497,476

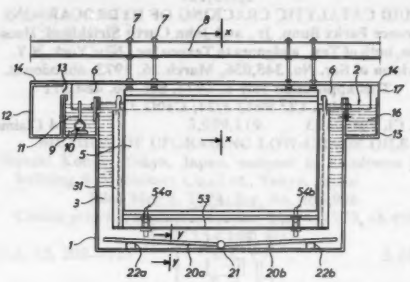
Claims priority, application France, Aug. 16, 1973, 73.29904

Int. Cl.³ C25C *1/08, 7/00;* **C25B** *1/26*

U.S. Cl. 204—258 **20 Claims**

1. A cell for producing metal by electrolyis of aqueous solutions of a chloride of the metal, comprising at least one electrolytic tank having upright cathodes and upright insoluble anodes alternating in the longitudinal direction of the tank each anode being surrounded by an anodic box whose sides which face cathodes each comprise a diaphragm, the cell further comprising means of collecting and recovering the chlorine released during electrolysis, means of drawing off vapour generated at the surface of the electrolyte, means of blowing gas into the bottom of the tank below each cathode, and locating means for use in placing and for retaining in position the cathodes, the anodes and the anodic boxes, said means of collecting and recovering the chlorine comprising a hermetic anodic bell capping each said anodic box and having its lower edges below the electrolyte overflow level, a longitudinally extending trough fixed to the tank and in communication therewith below the electrolyte overflow level, a chlorine

collector pipe running along the said trough, feed tube means communicating with the pipe and with the inside of each said



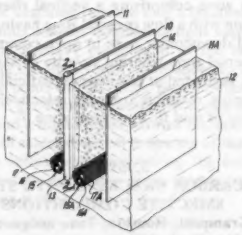
anodic bells above the electrolyte overflow level, the collector pipe being connectable to suction means for recovering the chlorine released.

3,959,112

DEVICE FOR PROVIDING UNIFORM AIR DISTRIBUTION IN AIR-AGITATED ELECTROWINNING CELLS

Carl A. Arend, Jr., Armonk, N.Y., assignor to Amax Inc., Greenwich, Conn.

Filed June 12, 1975, Ser. No. 586,233
Int. Cl.² C25C *1/12, 7/00*
U.S. Cl. 204—273 **6 Claims**



1. In an electrolytic refining system wherein refined metal is deposited onto a plurality of cathodes extending downwardly into an electrolyte with the bottom of each cathode terminating short of the bottom of a tank in which the electrolyte is confined, an improved device for inhibiting surface roughness formation of said deposited metal comprising:

a pair of tubular air-sparging elements cooperatively associated with each cathode, each element of said pair of tubular elements being disposed at opposite faces of the cathode at the bottom of said each cathode and running substantially the entire length of said bottom,

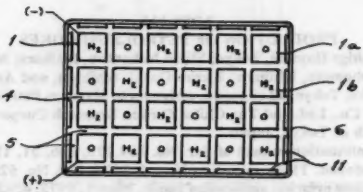
each of said air-sparging elements comprising a rigid inner tube of substantially inert material disposed within an outer foraminous sleeve of inert material and of larger diameter, said inner tube having a plurality of air-emitting orifices disposed along said tube through which air is emitted at substantially no pressure drop, the foraminous sleeve being characterized by a permeability such that air passes therethrough at a substantial pressure drop.

3,959,113

SQUARE FORM PERMEABLE ELECTRODES FOR PRESSURE ELECTROLYSIS PROCESS UNITS

Donald A. Kelly, 58-06 69th Place, Maspeth, N.Y. 11378

Filed Feb. 19, 1975, Ser. No. 551,044
Int. Cl.² C25B *1/03*
U.S. Cl. 204—278 **10 Claims**



6. Multiple elongated square form permeable electrodes each comprised of fine wire mesh sieve cloth of 400 mesh size made in one rectangular piece for pressure-electrolysis process units,

said fine wire mesh sieve cloth of 400 mesh size having three vertical folds to form a square box-like pattern,

a vertical elongated core framework consisting of four vertical members with uniformly spaced horizontal ribs disposed between said four vertical members,

two joining tabs disposed at the ends of said fine wire mesh sieve cloth of 400 mesh size for joining and sealing around said core framework,

bonding and sealing means securing said fine wire mesh sieve cloth of 400 mesh size around said vertical elongate core framework to form said electrode,

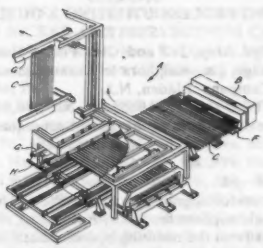
a bottom square non-permeable thin plate bonded and sealed to the bottom of each of said formed electrode.

3,959,114

APPARATUS FOR ARRANGING MATERIALS AT UNIFORM INTERVALS

Hisao Kirino, Funabashi, and Kazumi Onda, Nagareyama, both of Japan, assignors to Nikkei Aluminium Company, Ltd., Tokyo, Japan

Filed Mar. 6, 1974, Ser. No. 448,756
Claims priority, application Japan, Mar. 6, 1973, 48-26827
Int. Cl.² C25D *17/08*
U.S. Cl. 204—297 W **17 Claims**



1. An apparatus for arranging articles, materials, and the like at an equidistance between adjacent sides of said article and for transferring said articles to another location comprising:

a. a plurality of distance members arranged in parallel rows, said rows being aligned at a right angle relative to the direction of transfer; said distance members each comprising a pair of distance units adapted to move toward and away from each other respectively, and

b. a closing and opening means for moving said distance units toward and away from each other whereby when said distance units are moved toward and away from each other to produce a selected distance between one of the distance units and an adjacent distance units thus permitting articles to be arranged with uniform spacing even if the articles are different in dimension as measured in the direction to be transferred.

3,959,115
PRODUCTION OF PETROLEUM COKES

Kiyoshige Hayashi, Tokyo; Mikio Nakaniwa, Ichihara; Minoru Yamamoto, Ichihara; Kazuo Ozaki, Ichihara, and Arimasa Baba, Tokyo, all of Japan, assignors to Maruzen Petrochemical Co., Ltd. and The Chiba Carbon Research Corporation, both of Tokyo, Japan

Continuation-in-part of Ser. No. 334,273, Feb. 21, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,855
Claims priority, application Japan, Mar. 1, 1972, 47-20625
Int. Cl.² C10G 9/14
U.S. Cl. 208—53 **3 Claims**

1. A process for the production of high crystalline coke from a virgin crude oil having a sulfur content of lower than 0.4% by weight and substantial amounts of non-crystalline substances which prevent the growth of coke crystals which comprises removing said non-crystalline substances by:

preheating the virgin crude oil in a tube heater to a to a temperature of 460° – 520°C under a pressure of 5 – 20 kg/cm²G;

maintaining the oil in the tube heater at that temperature for 30 – 500 seconds to effect cracking and heat-soaking thereof;

flashing the oil thus heat-treated into a first coking drum, where the oil is subjected to a first delayed coking at a temperature of 410° – 430°C under a pressure of 2–10 kg/cm²G for a residence time of 3 – 5 hours to produce a non-crystalline coke;

removing from the flashed product of the first coking drum cracked gases and light petroleum fractions including gasoline, kerosene and gas oil to provide a heavy residue substantially free of said non-crystalline substances;

preheating said heavy residue of the flashed product to a temperature required for a second coking stage; and

introducing the preheated heavy residue into a second coking drum, where it is subjected to a second delayed coking at a temperature of 430° – 460°C under a pressure of 4 – 20 kg/cm²G to produce said high-crystalline coke.

3,959,116
REFORMING PROCESS UTILIZING A DUAL CATALYST SYSTEM

William Floyd Arey, Jr., and Glen Porter Hamner, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

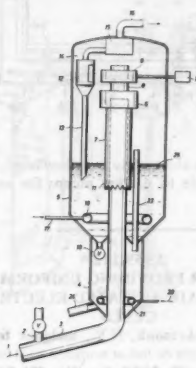
Filed Oct. 15, 1965, Ser. No. 496,659
The portion of the term of this patent subsequent to July 18, 1984, has been disclaimed.
Int. Cl.² C10G 39/00
U.S. Cl. 208—66 **13 Claims**

1. A process for upgrading a naphtha feed which comprises subjecting said naphtha feed to hydroforming, removing naphtha fractions from the resulting hydroformate, and contacting said naphtha fractions with a sulfactivated catalyst comprising a metallic hydrogenation component combined with a crystalline alumino-silicate zeolite having uniform pore openings of about 5 Angstrom units, wherein the metal in said metallic hydrogenation component is in a form selected from the group consisting of the free metal, oxide, sulfide and a mixture thereof, and wherein said zeolite has been base exchanged to reduce its alkali metal content to less than 10 wt. % and contains a Group II-B metal, in the presence of added hydrogen, and at a temperature of about 800° to 950°F. and a pressure of about 275 to 500 psig, and recovering a naphtha product having improved octane rating.

3,959,117
FLUID CATALYTIC CRACKING OF HYDROCARBONS

Dorrance Parks Bunn, Jr., and John Curtis Strickland, Houston, both of Tex., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 345,036, March 26, 1973, abandoned. This application July 1, 1974, Ser. No. 484,371
Int. Cl.² B01J 8/24; C10G 37/06
U.S. Cl. 208—113 **4 Claims**



1. A fluidized catalytic cracking process for conversion of hydrocarbon stock in the presence of a fluidizable cracking catalyst, at cracking conditions, in a vertical, elongated transport reaction zone comprising a vertical riser zone in open communication with a flow reversal zone having a closable top and a vertical downcomer zone in open communication with said flow reversal zone wherein severity of said hydrocarbon conversion is regulated at constant superficial vapor velocity in said transport reaction zone by selectively opening and closing the top of said flow reversal zone.

3,959,118
HYDROCARBON CRACKING WITH SYNTHETIC SMECTITE COMPOSITIONS

William T. Granquist, Houston, Tex., assignor to N L Industries, Inc., New York, N.Y.

Continuation of Ser. No. 257,303, May 26, 1972, Pat. No. 3,855,147. This application Dec. 10, 1974, Ser. No. 531,366
Int. Cl.² B01J 8/24; C10G 11/02
U.S. Cl. 208—120 **4 Claims**

1. The process of cracking hydrocarbons which includes the step of passing said hydrocarbons during said cracking process in the absence of added H_2 over a catalyst obtained by calcining a synthetic mineral composition having the following formula per unit cell:

$$\left\{ \begin{matrix} [Mg_6Al_zSi_{8-z}O_{20}\ (OH_{4-a}F_a)]^{z-}\ xM^{z}/z \\ (O,OH) \end{matrix} \right\} + y\ Mg$$

in which the contents of the braces constitutes said unit cell of a smectite and in which the contents of the square brackets represents the fixed lattice portion of the unit cell, said fixed lattice portion having a negative charge; and in which M represents cations balancing said negative charge, and wherein z is the valence of said M, and in which said M is selected from the group of cations consisting of ammonium ions, substituted ammonium ions, and mixtures thereof; and in which y Mg (O,OH) is an accessory phase occluded with said

smectite and consisting of hydrous magnesium oxide selected from the class consisting of magnesium oxide, magnesium hydroxide, hydrous magnesium oxide species intermediate therebetween, and mixtures thereof; and in which said x, said y, said z, and said a have values within the following ranges:

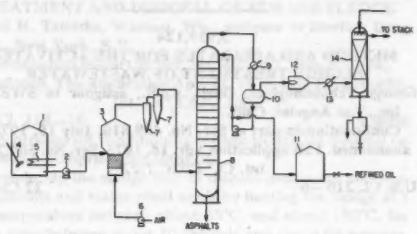
$$0.1 \leq x \leq 1.5$$
$$0.1 \leq y \leq 2$$
$$0 \leq a \leq 2$$
$$1 \leq z \leq 2.$$

3,959,119

METHOD OF UPGRADING LOW-GRADE OILS

Masaki Kondo, Tokyo, Japan, assignor to Sumitomo Shipbuilding & Machinery Co., Ltd., Tokyo, Japan

Filed May 1, 1974, Ser. No. 465,998
Claims priority, application Japan, May 4, 1973, 48-49036
Int. Cl.² C10G *9/32*
U.S. Cl. 208—127 **5 Claims**



1. A method of recovering a refined oil from waste oil containing substantial amounts of water and sludge which comprises the steps of introducing the waste oil directly into a fluidized bed type cracking furnace and subjecting it to thermal cracking therein, introducing the resulting gaseous efflux from said cracking furnace into a fractionation column to separate it into a water containing light vapor component as distillate and a heavy component at the bottom of said column, cooling the light vapor component to a temperature above the dew point of the water present therein and then feeding it into a gas-liquid separator to divide it into a vapor phase stream and a liquid phase refined oil, and circulating at least a portion of said refined oil to the top of the fractionation column as the reflux while recovering the rest as the final product, and feeding said vapor phase stream to a gas incinerator and burning it therein.

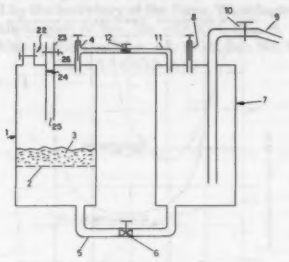
3,959,120

APPARATUS FOR PREPARING FERMENTED LIQUIDS

James Richard Allen Pollock, and Michael Joseph Weir, both of Reading, England, assignors to James R. A. Pollock, England

Filed Mar. 4, 1974, Ser. No. 447,682
Int. Cl.² C12B *1/00*
U.S. Cl. 195—141 **3 Claims**

1. Apparatus for preparing a fermented liquid essentially free of yeast comprising a first, fermentation chamber for receiving a charge of fermentable liquid, filter aid material and yeast, said first chamber including means permeable to liquid for filtering the liquid and retaining the yeast and filter aid material within said first chamber; a second, storage chamber for receiving fermented and filtered liquid and including a closable outlet for the fermented and filtered liquid; a closable passage directly connecting said first chamber to the second chamber so as to provide for a flow of liquid, which has been fermented and filtered in the first chamber, from the first chamber to the second chamber; and means for independently controlling the gas pressure in each chamber to enable the first chamber to be at a higher pressure than the second chamber, including a pressure regulating valve associated with the first chamber, the outlet of said pressure regulating valve



being connected to the second chamber for passage of gas from a level above the normal liquid level in the first chamber to the second chamber.

3,959,121

HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 5, 1975, Ser. No. 574,222
Int. Cl.² C10G *35/08*; C01G *13/08*; B01J *27/06*; C07C *5/24*
U.S. Cl. 208—139 **22 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % indium, and about 0.1 to about 3.5 wt. % halogen, wherein the platinum group metal, catalytically available cobalt, and indium are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal is present in the elemental metallic state, wherein substantially all of the indium is present in an oxidation state above that of the elemental metal, and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

3,959,122

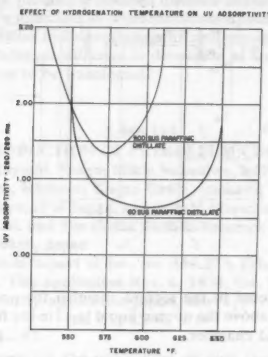
MAKING A WHITE OIL BY HYDROGENATION WITH A SULFIDED NICKEL AND MOLYBDENUM CATALYST

Ivor W. Mills, Media, and Glenn R. Dimeler, West Chester, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Division of Ser. No. 228,832, Feb. 24, 1972, Pat. No. 3,839,189, and a continuation-in-part of Ser. Nos. 622,398, March 13, 1967, Pat. No. 3,462,358, Ser. No. 652.026, July 10, 1967, Pat. No. 3,502,567, Ser. No. 730,999, May 22, 1968, Pat. No. 3,839,188, Ser. No. 850,716, Aug. 18, 1969, abandoned, Ser. No. 850,717, Aug. 18, 1969, abandoned, Ser. No. 873,008, Oct. 31, 1969, abandoned, Ser. No. 22,295, March 24, 1970, Pat. No. 3,681,233, Ser. No. 165,006, July 22, 1971, Pat. No. 3,804,743, Ser. No. 165,141, July 22, 1971, Pat. No. 3,759,817, and Ser. No. 175,775, Aug. 27, 1971, abandoned. This application Sept. 30, 1974, Ser. No. 510,527
Int. Cl.² C10G *23/02*
U.S. Cl. 208—143 **2 Claims**

1. Process for producing a technical white oil having an ultraviolet absorptivity in the 280–289 millimicron region less than 2.0 and having a viscosity in the range of 300–600 SUS at 100°F., said process comprising hydrogenating a paraffinic

distillate having a viscosity in the range of 400–600 SUS at a temperature in the range of 550°–600°F., at a hydrogen partial pressure in the range of 800–3000 p.s.i. and a total pressure



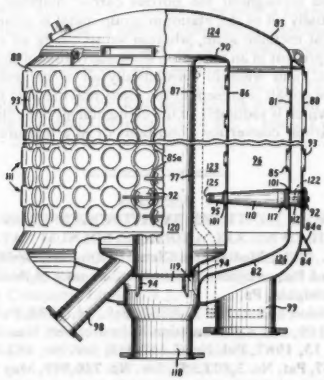
in the range of 800–6000 p.s.i.g., in the presence of a hydrogenation catalyst consisting essentially of sulfides of nickel and molybdenum on alumina, and at a liquid hourly space velocity in the range of 0.1–1.0.

3,959,123

HYDROCYCLONE SEPARATOR UNIT WITH DOWNFLOW DISTRIBUTION OF FLUID TO BE FRACTIONATED AND PROCESS

Nils Anders Lennart Wikdahl, 42 Bravallavagen, 182 64 Djursholm, Sweden

Filed Aug. 6, 1973, Ser. No. 386,236
Claims priority, application Sweden, Oct. 4, 1972, 12809/72
Int. Cl.² B04C *5/28*
U.S. Cl. 209—211 **32 Claims**



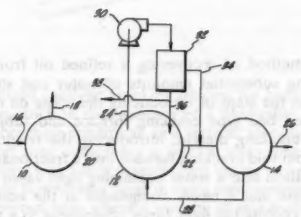
1. A hydrocyclone separator unit comprising a housing; an array of hydrocyclones arranged in the housing in a plurality of more than two superimposed layers, in which layers the hydrocyclones are at least approximately horizontally oriented, each hydrocyclone having a conical vortex chamber having a base end provided with an inject inlet and a base outlet and an opposed apex end provided with an apex outlet; one of the base outlet and apex outlet constituting a reject outlet for reject flow, and the other an accept outlet for accept flow; a first wall in the housing along which the hydrocyclones are distributed in layers, one above the other; a first collection chamber in the housing common to and communicating with a plurality of the vortex chambers by way of the outlets at one end of the hydrocyclones; a second wall in the housing along which the hydrocyclones are distributed in layers, one above the other; a second collection chamber in the housing common to and communicating with a plurality of the vortex chambers by way of the outlets at the other end of the hydrocyclones; a distribution chamber in the housing intermediate the first and second walls common to and communicating with a plurality of the vortex chambers by way of the inject inlets; and means for feeding at least 25% up to 100% of the liquid suspension to be fractionated to the uppermost of the layers of the hydrocyclones in the housing via the distribution chamber so as to proceed by downflow, descending from the uppermost of the superimposed hydrocyclone layers to each of the layers of hydrocyclones therebelow; a first outlet in the first collection chamber, and a second outlet in the second collection chamber; the first and second outlets each being adjacent the bottom of the first and second collection chambers, respectively, and receiving and delivering flow from the collection chambers only by downflow.

3,959,124

METHOD AND APPARATUS FOR THE ACTIVATED SLUDGE TREATMENT OF WASTEWATER

George Tchobanoglous, Davis, Calif., assignor to SWECO, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 488,816, July 15, 1974, abandoned. This application Apr. 18, 1975, Ser. No. 569,267
Int. Cl.² C02C *1/22*
U.S. Cl. 210—6 **22 Claims**



1. An activated sludge wastewater treatment facility employing an aeration basin and a secondary clarifier wherein the improvement comprises:

screening means constructed and arranged for receiving at least a portion of the flow from the aeration basin for removal of a portion of the solids from the flow received, said screening means dividing the flow received into a screened effluent and a concentrate, said screening means including at least a first screen and distribution means for directing the flow received to at least said first screen with substantial relative movement therebetween, whereby said first screen is maintained in a substantially unclogged condition;

first passageway means extending from said screening means to the secondary clarifier for directing said screened effluent to the secondary clarifier; and

second passageway means extending from said screening means to the aeration basin for returning said concentrate to the aeration basin for control of the mean cell residence time within the aeration basin.

16. A method for increasing the capacity of an activated sludge wastewater treatment process, including the steps of:

aerating wastewater in an aeration basin using activated sludge;

directing at least a portion of the flow from the aeration basin to a screening device;

distributing the flow received against screens of the screening device with substantial relative velocity resulting between the screens and the flow directed to the screens

such that the screens are maintained in a substantially unclogged condition;

screening the flow received from the aeration basin to reduce the amount of solids contained therein to a level where the entire flow from the aeration basin will have a solids concentration below the maximum solids loading for the secondary clarifier to operate at hydraulic capacity;

directing the screened effluent from the screening device to the secondary clarifier; and

directing at least a portion of the concentrate from the screening device back to the aeration basin to control solids concentration and mean cell residence time withiin the aeration basin.

3,959,125

TREATMENT AND DISPOSAL OF SEWAGE SLUDGE

Gerald H. Teletzke, Wausau, Wis., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 485,981, July 5, 1974, abandoned. This application Apr. 21, 1975, Ser. No. 570,035

Int. Cl.² C02C *3/00*

U.S. Cl. 210—10 **7 Claims**

1. A process for conditioning sewage sludge for disposal on land which comprises the steps of:

a. rendering the sludge free of disease-producing microorganisms and viable plant seeds by heating the sludge at a temperature between about 65°C. and about 150°C. for a time between about 30 seconds and about 60 minutes, the time varying inversely with the temperature; and

b. without any separation of solid and liquid phases treating the resulting fluid sterilized sewage sludge by biological digestion at a temperature between about 32°C. and 60°C.

3,959,126

SEWAGE HANDLING AND DISPOSAL PROCESS FOR CHLORIDE (NaCl) CONTAMINATED SLUDGES

Richard S. Millward, Stratford, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Aug. 17, 1972, Ser. No. 281,419

Int. Cl.² C02C *5/06*

U.S. Cl. 210—10 **6 Claims**

1. The method of treating sewage containing concentrations of NaCl from salt water infiltration, which become highly corrosive at sewage sludge sterilizing temperatures, which method comprises

subjecting the sewage to treatment producing biologically treated sludge,

subjecting said biologically treated sludge to centrifugal separating concentrating treatment in a nozzle type centrifugal machine having a centrifugal separating chamber to which the sludge is fed, delivering through the nozzles of the machine a concentrated underflow fraction of controllable concentration, and an overflow fraction of separated liquid,

feeding wash water into said centrifugal separating chamber at a rate effective to block NaCl by said wash water from discharging with the underflow fraction by displacing said NaCl by said wash water towards overflow, thereby effecting delivery of underflow sludge substantially freed of NaCl, and an overflow containing said displaced NaCl,

and heating said underflow sludge from the centrifugal machine by passage through heating apparatus that would otherwise be susceplible to corrosion by the displaced NaCl at said sterilizing temperatures.

3,959,127

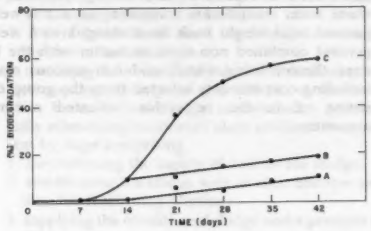
BIODEGRADATION OF OIL ON WATER SURFACES

Richard Bartha, East Brunswick, N.J., and Ronald M. Atlas, Louisville, Ky., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 421,874, Dec. 5, 1973, abandoned. This application Mar. 13, 1975, Ser. No. 558,040

Int. Cl.² C02B *9/02*

U.S. Cl. 210—11 **1 Claim**



1. A process for removing polluting petroleum hydrocarbons from bodies of water by rendering them degradable to microorganisms indigenous to natural waters comprising:

stimulating the proliferation and activity of said hydrocarbon degrading microorganisms by adding to the hydrocarbons sources of nitrogen and phosphorous having a strong affinity for oils,

said sources being, respectively, a paraffinized urea slow-release garden fertilizer with a nitrogen content of substantially 25% and pyrophosphoric acid dioctyl ester in a substantially 9 to 1 ratio of fertilizer to ester.

3,959,128

PROCESS FOR REMOVING ENDOTOXIN FROM BIOLOGICAL FLUIDS

Nick S. Harris, Galveston, Tex., assignor to Preventive Systems, Inc

Filed Dec. 27, 1974, Ser. No. 536,833

Int. Cl.² B01D *15/00*

U.S. Cl. 210—24 **15 Claims**

10. An in vivo hemoperfusion polymer-column process for removing endotoxin derived from gram-negative bacilli from the blood of an animal, said process comprising:

removing blood from an animal;

perfusing said blood through a column containing particles of a non-ionogenic hydrophobic non-polar aliphatic synthetic plastic polymer selected from the group consisting of a substantially crystalline non-polar aliphatic hydrocarbon thermoplastic polymer, a crystalline aliphatic thermoplastic fluorocarbon polymer, a cross-linked silicone elastomeric polymer and mixtures thereof, whereby gram-negative bacilli derived endotoxin is adsorbed onto the surface of the synthetic plastic polymer particles; and

reinfusing the blood passing from said column into the animal.

3,959,129

WASTE TREATMENT PROCESS

Harold R. White, New Lenox, and Alexander J. Doncer, Burbank, both of Ill., assignors to Alar Engineering Corporation, Bedford Park, Chicago, Ill.

Filed Jan. 14, 1974, Ser. No. 432,950

Int. Cl.² B01D *21/01*

U.S. Cl. 210—28 **16 Claims**

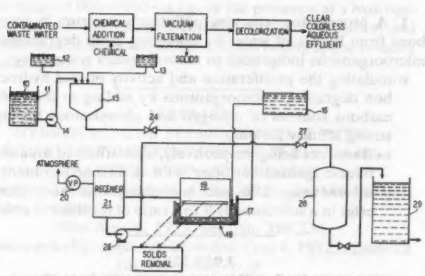
1. A process for treating waste waters comprising the steps of sequentially:

A. mixing with a waste water composition from about 500 to 5000 parts per million (based on total composition) of

a dissolved, water-soluble iron salt, selected from the group consisting of ferrous sulfate, ferric sulfate, and ferric chloride, said waste water composition being selected from the group consisting of:

a. water derived from clean-up of at least one water based printing ink of a flexographic type, and

b. water derived from clean up of at least one starch based adhesive of a type used in corrugated paper board manufacture, and, said waste water composition containing from about 4,000 to 60,000 parts per million based on total composition of suspended solids below about 200 millimicrons in average diameter, said waste water composition comprising on a 100 weight percent total weight basis from about 1 to 6 weight percent combined non-aqueous matter with the balance thereof being water, said non-aqueous matter including contaminants selected from the group consisting of in the respective indicated minimum amounts:



Contaminant	Minimum amount present (parts by weight per million total composition)
Chrome (trivalent) ions	10.
Chrome (hexavalent) ions	5.0
Copper ions	3.0
Cyanide ions	2.0
Iron ions	15.0
Lead ions	0.1
Oil (hydrocarbon)	100.
Phenol	0.5
Zinc ions	2.0

B. agitating the resulting mixture for a time ranging from about 20 minutes to 4 hours,

C. mixing with the so-agitated mixture from about 500 to 5000 parts per million (based on total composition) of calcium hydroxide, said calcium hydroxide being comprised initially of particles not greater than about 250μ,

D. agitating the resulting mixture for a time ranging from about 20 minutes to 4 hours, and

E. continuously passing the resulting mixture over cylindrical outer surface portions of a horizontally rotating drum of a vacuum filter assembly, said surface portions being coated with a layer of substantially completely water-insoluble, inert, particulate material having a particle size below about 250μ while simultaneously continuously drawing aqueous portions of said resulting mixture through said surface portions and also continuously removing along a longitudinal position of said rotating drum the filter cake deposited on said outer surface portions thereof.

3,959,130

PROCESS FOR DECONTAMINATING SEWAGE CONTAINING CYANIDE

Heinz Kloster; Gerhard Preusser, and Paul Radusch, all of Essen, Germany, assignors to Heinrich Koppers Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed July 31, 1974, Ser. No. 493,461

Claims priority, application Germany, Aug. 16, 1973, 2341228

Int. Cl.[2] C02B *1/14*

U.S. Cl. 210—37 R **13 Claims**

1. A process for the decontamination of sewage which contains cyanide, comprising removing cyanide from sewage containing the same by maintaining said sewage in intimate contact with a fly ash product produced during the gasification and/or combustion of a solid fuel selected from the group consisting of lignite, coal and coal dust at a pH of at least 7 and for a period of at least 10 minutes, said fly ash product comprising particles of a size less than about 25 microns; and thereafter separating said fly ash product and said sewage.

3,959,131

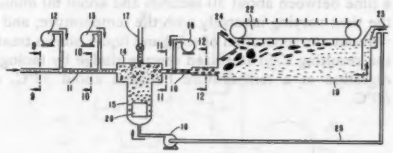
APPARATUS AND METHOD FOR REMOVING POLLUTANTS FROM WASTEWATER

Ernest R. Ramirez, Lemont, and Dennis L. Johnson, Woodridge, both of Ill., assignors to Swift & Company, Chicago, Ill.

Filed Oct. 17, 1974, Ser. No. 515,638

Int. Cl.[3] B01D *12/00*; B01F *3/04*

U.S. Cl. 210—44 **33 Claims**



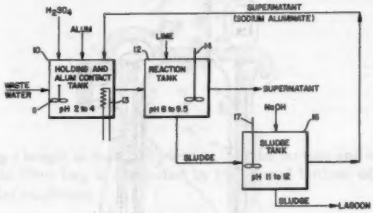
1. A method for removing pollutants from raw wastewater comprising steps of: introducing a flow of wastewater into a compact and dense zone of fine bubbles originating from a bubble supply below said zone, substantially all of the pollutants within the wastewater remaining above said bubble supply at all times; churning said pollutants with said bubbles while said wastewater remains within said zone whereby said fine bubbles are rapidly contacted with said pollutants to form aggregates of bubbles and pollutants, said aggregates remaining unseparated from said wastewater flow; flowing substantially all of said wastewater flow, together with said unseparated aggregates, out of said zone; introducing said aggregates and wastewater into a flotation basin to permit the aggregates to rise to the surface of the wastewater; and separating the aggregates from the remainder of the wastewater, which has thus been substantially clarified of pollutants.

17. An apparatus for removing pollutants from raw wastewater comprising: a tank for confining an initially horizontal flow of wastewater, said tank being substantially free of obstructions, a cell having therein a bubble introduction means for providing fine bubbles, said cell being located below and in communcation with said tank, whereby pollutants within said wastewater combine with said bubbles within said tank to form aggregates of pollutants and bubbles, said aggregates remaining unseparated from said wastewater flow; a wastewater influx conduit; a treated wastewater transfer conduit for removing substantially all of said treated wastewater flow and said unseparated aggregates together from said tank, each conduit being in communication with said tank; and a flotation basin in communication with said transfer conduit, said flotation basin being for separating said aggregates of pollutants and bubbles from the thus clarified wastewater.

3,959,132
METHODS FOR REMOVING FLUOBORATES FROM AQUEOUS MEDIA

Jaswant Singh, East Syracuse, N.Y., assignor to Galson Technical Services, Inc., East Syracuse, N.Y.

Filed Oct. 25, 1974, Ser. No. 517,964
Int. Cl.² C02B 1/20
U.S. Cl. 210—45 10 Claims

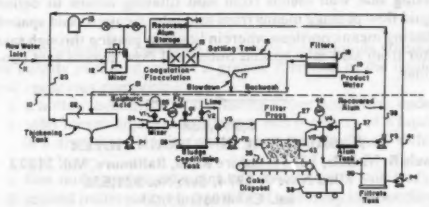


1. A method for removing from an aqueous medium one or more fluoborate compounds dissolved in the medium, said method comprising the steps of: hydrolyzing said fluoborates by adding to the medium at a pH in the range of 2 to 4 an additive capable of furnishing aluminum ions at a rate varying from 0.5 to 2 ppm of aluminum ion per one ppm of fluoborate ion in an amount sufficient to convert the fluoborates to compounds from which fluorides can be precipitated; thereafter adding to the aqueous medium a material capable of furnishing calcium ions to the medium, said material being added in an amount sufficient to raise the pH of the medium to in the range of 8 to 9.5, thereby freeing fluoride ions from the hydrolysis products in an environment in which they will react with the calcium ions to form a precipitate; and separating the precipitate and supernatant to thereby free the aqueous medium of the fluorine-containing compound or compounds.

3,959,133
ALUM RECOVERY AND WASTE DISPOSAL IN WATER TREATMENT

George P. Fulton, Darien, Conn., assignor to Metcalf & Eddy, Inc., New York, N.Y.

Filed Sept. 11, 1974, Ser. No. 505,067
Int. Cl.² C02B 1/20
U.S. Cl. 210—45 2 Claims



1. In a raw water treatment system in which alum is added to the water undergoing treatment and followed by steps including coagulation-flocculation, settling and filtering to produce product water, the treatment resulting in a sludge containing aluminum hydroxide, the improvement which comprises

A. recovering alum from said sludge and reusing the alum by steps comprising
1. acidulating the sludge with sulphuric acid to produce alum from the aluminum hydroxide therein,
2. conditioning the acidulated sludge with an inert additive for facilitating filtering,
3. supplying the conditioned sludge under pressure to a filter press to produce a cake from the solids therein and a filtrate containing alum, and
4. returning alum in the filtrate to said water treatment system;

B. interrupting the steps of (A) as said filter press loads up and neutralizing and removing cake from the filter press by steps comprising
1. discontinuing the supply of acidulated conditioned sludge to the filter press,
2. supplying a lime slurry under pressure to the filter press to neutralize the cake therein,
3. returning the filtrate from the filter press to said water treatment system, and
4. removing the neutralized cake from the filter press; and

C. interrupting the steps of (A) and (B) as the recovered alum becomes undesirably contaminated and substantially eliminating recovered alum products from the system by steps comprising
1. discontinuing the supply of acid to the sludge,
2. conditioning the sludge with an inert additive and with lime for facilitating filtering,
3. supplying the conditioned sludge under pressure to said filter press,
4. returning the filtrate from the filter press to the water treatment system, and
5. removing the cake from the filter press.

3,959,134
OIL COLLECTION AGENTS AND THEIR USE IN CONTAINING OIL SLICKS

Gerard P. Canevari, Cranford, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 453,014, March 19, 1974, abandoned. This application Feb. 18, 1975, Ser. No. 550,511
Int. Cl.² C02B 9/02
U.S. Cl. 210—59 13 Claims

1. A method of containing an oil slick on the surface of water which comprises applying to the water surface at the perimeter of said oil slick an effective amount of an oil collection agent comprising a surfactant selected from the group consisting of aliphatic monocarboxylic acids and sorbitan monoesters of aliphatic monocarboxylic acids having from C_{10} to C_{20} carbons and mixtures thereof, in combination with a glycol solvent selected from the group consisting of monoethylene monoalkyl glycol ethers and diethylene monoalkyl glycol ethers, and a nonpolar solvent selected from the group consisting of isoparaffinic hydrocarbons having a boiling point in the range of from about 240°F. to about 485°F.

7. An oil collection agent for the containment of an oil slick on the surface of water which comprises:

a. a surfactant selected from the group consisting of aliphatic monocarboxylic acids and sorbitan monoesters of aliphatic monocarboxylic acids having from C_{10} to C_{20} carbons and mixtures thereoof;

b. a glycol solvent selected from the group consisting of monoethylene monoalkyl glycol ethers and diethylene monoalkyl glycol ethers; and

c. a nonopolar solvent selected from the group consisting of isoparaffinic hydrocarbons having a boiling point in the range of from about 240°F. to about 485°F.

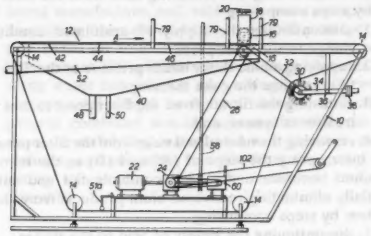
3,959,135
DEWATERING OF SLURRIES

Geoffrey Francis Shuttock, 5, Orchard Close, Long Lane, Tilehurst, Reading, Berkshire, England

Continuation of Ser. No. 396,681, Sept. 13, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,723
Int. Cl.³ B01D 33/02
U.S. Cl. 210—77 22 Claims

1. Apparatus for dewatering a fibrous organic slurry comprising (a) a moving dewatering screen of flexible inextensible material unsupported by a corresponding carrier which moves

with the material, said material being between about 2 and about 65 thousandths of an inch in thickness and of a mesh size up to about 3 mm, (b) opposed rollers between which the screen passes, (c) means for applying via the rollers a wringing



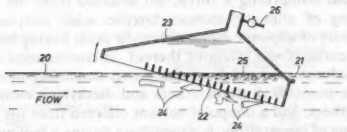
pressure between about 300 and about 600 psi to the screen and slurry thereon, and (d) means for driving the rollers to move the screen past the rollers solely by pinch action of the rollers at a speed between about 20 and about 40 feet per minute.

3,959,136

OIL SPILL CLEANUP METHOD AND APPARATUS

Ray R. Ayers, and Dean P. Hemphill, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 289,043, Sept. 14, 1972, abandoned.
This application Sept. 9, 1974, Ser. No. 504,595
Int. Cl.² B01D *21/00*; E02B *15/04*
U.S. Cl. 210—83 **11 Claims**



1. An apparatus for removing oil from the surface of a body of water comprising:

a pair of longitudinal laterally spaced floats;

an oil removing receptacle supported over the water surface between the floats;

said receptacle comprising an inverted funnel of upwardly converging walls and a bottom of baffles permitting restricted flow of oil and water into the funnel;

means connecting the receptacle to the floats about an axis located transverse the floats, adjacent a wall of the receptacle, and vertically disposed at a level above the bottom of baffles;

means for pivoting the receptacle about said axis into an oil collection mode between the floats to an angle acute to the water surface, the forward side of the funnel being elevated to the proximity of the water surface and the rearward side of the funnel being depressed below the water surface;

means for pivoting the receptacle about said axis into an oil withdrawal mode by depressing the bottom of the receptacle below the water surface to force oil and water upwardly in the skimmer; and

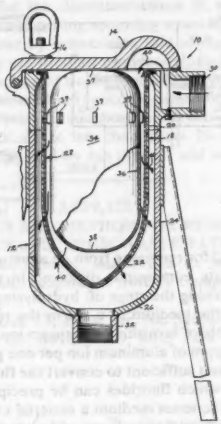
means for withdrawing oil from the skimmer at or near an apex formed by the converging walls.

3,959,137

FILTER HAVING AN INTERIOR LIQUID DISPLACEMENT MEANS, APPARATUS AND METHOD

Richard D. Kirsgalvis, Chicago, Ill., assignor to Filter Specialists, Inc., Michigan City, Ind.

Continuation of Ser. No. 438,280, Jan. 31, 1974, abandoned.
This application Aug. 7, 1975, Ser. No. 602,590
Int. Cl.² B01D *23/04*, *29/10*
U.S. Cl. 210—84 **6 Claims**



2. A filter for a liquid, said filter comprising a housing having a base member and a removable cap, said base member having an open top and being defined by side and bottom walls, said cap spanning said base member top, a bag-shaped reticulated filtering means carried within said housing and having portions spaced from said base member, said filtering means having a shape-retaining frame and including a side wall, said housing having a liquid inlet means in flow communication with the interior of said filtering means and a liquid outlet means in flow communication with said base member at said spaced filtering means portions, a removable floatable container means for decreasing the volumetric interior size of said filtering means, said container means fitting within said filtering means and having spaced projecting side wall means for contacting said filtering means side wall to space that portion of said container means extending between said projecting side wall means from said filtering means to define liquid flow passage means from said inlet means to said spaced filtering means portions wherein liquid in passing through said filter from said inlet to said outlet will flow around said container.

3,959,138

WASHING MACHINE DRAIN FILTER

Louis B. Nichols, 1213 Hillshire Road, Baltimore, Md. 21222

Filed Nov. 7, 1974, Ser. No. 521,836
Int. Cl.² B01D *35/00*
U.S. Cl. 210—94 **4 Claims**

1. A filter for a washing machine, said filter comprising a circular enclosure with sidewalls, a closed bottom, an open top, said sidewalls being perforate as means for permitting the flow of fluid therethrough and for permitting visibility into the interior of said circular enclosure, removable means for closing said open top of the circular enclosure, structure defining an inlet opening through the means for closing, a downward extension of said means for closing circumferentially spaced within said circular enclosure and having communication with said inlet opening, a flexible filter bag having an open upper end, said downward extension having means for removably retaining and sealing the open upper end of the flexible filter

bag against the outer peripheral surface of the downward extension, said flexible filter bag having a diameter at least equal to the internal diameter of the circular enclosure and

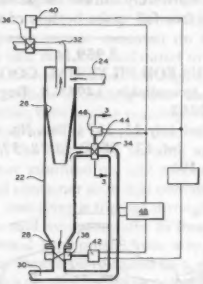
having a length at least sufficient so that the bottom end of the flexible filter bag is supported by the closed bottom of said circular enclosure.

3,959,139

LIQUID PURIFICATION SYSTEM

Ahmad M. El-Hindi, Fabius, N.Y., assignor to Filter Tech, Inc., Manlius, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,732
Int. Cl.[2] B01D *21/24*
U.S. Cl. 210—97 **8 Claims**



1. Apparatus for removing impurities from liquids wherein the density of the impurities is greater than that of the liquid, said apparatus comprising:

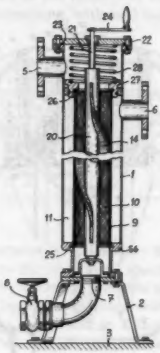
a. a hollow cylindrical body having upper and lower ends;
b. inlet means adjacent said upper end for entry of a liquid in a direction inducing rotary motion of the liquid within said body;
c. first outlet means adjacent said lower end of said body;
d. second outlet means in one side of said body intermediate of said upper and lower ends;
e. third outlet means adjacent said upper end of said body;
f. first, second and third valve means associated with each of said first, second and third outlet means, respectively;
g. said second valve means defining an orifice and being movable to vary the size of said orifice;
h. sensing means adapted to generate a signal in response to a predetermined restriction in the flow of liquid through said orifice; and
i. control means actuable in response to said signal to move said first and second valve means fully open and said third valve means fully closed.

3,959,140

FILTER ESPECIALLY INTENDED FOR FILTERING NATURAL WATER FOR THE IRRIGATION OF CULTIVATED FIELDS

Bertrand Léon Legras, 32, rue des Petits-Pres, Epernay, Marne, France

Filed July 30, 1974, Ser. No. 493,191
Int. Cl.[2] B01D *29/04*
U.S. Cl. 210—107 **11 Claims**



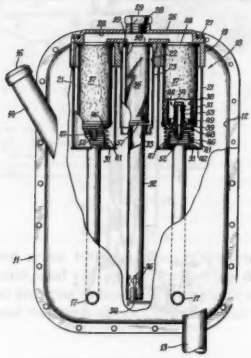
1. A cleansable filter for filtering out of a liquid solid impurities, comprising

a. a body communicating with the exterior through two lateral openings and a drainage opening, the lateral openings including an inlet opening for entry of the liquid to be filtered and an outlet opening for discharge of the filtered liquid, the drainage opening being located at the lower end of the body and at the opposite end of the body from the inlet opening, and means for keeping the drainage opening temporarily closed;
b. a filter element mounted inside the body and defining in the interior of the body two concentric chambers, the first of the chambers communicating with the exterior through the temporarily closed drainage opening and through one of the lateral openings, the second of the chambers having an annular form and surrounding the first chamber and communicating with the exterior through the other lateral opening;
c. a brush located within the first chamber and actuatable from the exterior, and briatles on the brush adapted to sweep the internal wall of the filter element;
d. the liquid to be filtered passing into the filter through the inlet opening communicating with the cylindrical chamber and leaving the filter through the outlet opening communicating with the annular chamber, after having passed through the filter element from the interior toward the exterior;
e. the filter element being composed of three concentric cylindrical parts fitted one into the other, including
i. an innermost part comprising a mesh of stainless steel having pores at least one of whose sides measures at least 40 microns;
ii. an outermost part comprising a sheet of stainless steel having pores at least one of whose sides measures at least 6 millimeters; and
iii. an intermediate part located between the said innermost and outermost parts and comprising a sheet of stainless material having pores at least one side of which measures at least five tenths of a millimeter;
iv. the said three parts being produced from substantially rectangular metal sheet and mesh, previously cut out on the flat and then rolled to the shape of a cylindrical sleeve, the lips of the mesh and the sheet being assembled by assembly means.

3,959,141
FLUID FILTER SYSTEM

Howard L. Johnson, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 8, 1974, Ser. No. 468,181
Int. Cl.² B01D *27/10*
U.S. Cl. 210—132 2 Claims



1. In a fluid filtering system, the combination comprising:

a pair of filter compartments each having an inlet region and an outlet region and having means for supporting a porous filter element in the flow path therebetween, said filter compartments being parallel spaced apart upright cylinders disposed within the upper portion of a fluid reservoir tank and each having a bottom closure and each having an upper end with an opening at the upper end of said tank and wherein said filter elements are cylindrical and a separate one thereof is disposed coaxially in each of said filter compartments,

a screen compartment separate from the filter compartments and having a fluid inlet and a fluid outlet and means for supporting a fluid permeable screen in the flow path therebetween,

said screen compartment being an additional cylinder disposed between said pair of filter compartment cylinders in parallel relationship therewith, and wherein said fluid permeable screen is a cylindrically shaped element diposed coaxially in said screen compartment,

a removable cover attached to said upper ends of said filter compartments and said screen compartment and having a flow conduit passage connecting said upper ends thereof to direct fluid from said outlet regions of said filter compartments to said inlet of said screen compartment,

flow conduit means for directing fluid to said inlet regions of said filter compartments for passage through said filter elements including fluid intake tube means extending upwardly into the lower ends of each of said filter compartments,

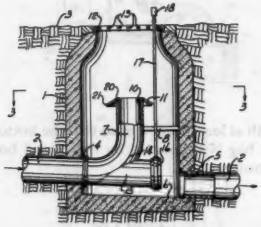
fluid discharge tube means extending downwardly from said lower end of said screen compartment within said tank, and

a pair of bypass valves each being situated within the lower region of a separate one of said filter compartments and each having means for directing said fluid to said screen compartment inlet independently of said filter elements in response to a predetermined fluid pressure rise within said inlet region of the associated one of said filter compartments each bypass valve having spring biased valve means for opening a direct flow passage between the lower portion of the associated one of said filter compartments and the lower interior region of the associated one of said filter elements in respone to said predetermined pressure rise within the lower portion of the associated one of said filter compartments.

3,959,142
MANHOLE AERATOR

Herman K. Dupre, c/o Seven Springs, Champion, Pa. 15622

Filed Feb. 8, 1973, Ser. No. 330,631
Int. Cl.² E02B *15/04*
U.S. Cl. 210—170 6 Claims

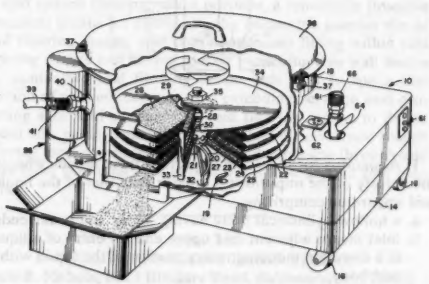


1. A manhole aerator including a vented manhole having a sewer inlet line and a sewer outlet line and wherein the improvement comprises an upwardly extended pipe section substantially centrally aligned within said manhole and secured to said inlet line and having an upwardly open end for the discharge of the sewage within said manhole, and an annular baffle member secured to said open end and adapted to annularly and outwardly diffuse the sewage flow thereabout and allow it to free fall to the bottom of said manhole.

3,959,143
APPARATUS FOR FILTERING COOKING LIQUIDS

Kostas Savas Arvanitakis, 14945 S. Dogwood Ave., Orland Park, Ill. 60462

Filed July 11, 1974, Ser. No. 487,608
Int. Cl.² B01D *33/28*, *37/02*
U.S. Cl. 210—196 19 Claims



1. An apparatus for filtering liquids such as cooking oils, shortening and the like, to remove particulate and chemical contaminants and eliminate odors, including a frame, container means mounted on said frame for receiving said liquid to be filtered and filter cake forming materials, said container means having an inlet and an outlet, pump means mounted on said frame in communication with said inlet and said outlet to circulate said liquid and filter cake forming material to said container through said inlet said inlet including means to create a vortex effect in said container means during circulation of said liquid and filter cake forming material to said container and to uniformly distribute the filter cake forming materials within said container, a generally vertical, hollow mounting tube disposed in said container, said mounting tube

having openings formed therein to admit filter liquid into the interior thereof, filter means mounted on said mounting tube to receive and retain the filter cake forming material circulated in said container preventing accumulation of these materials in the bottom of the container, said filter means positioned within said container such that contaminated liquid introduced into said container is filtered through a portion of said filter means into said mounting tube to flow downwardly within said tube toward said outlet from where it may be recycled to said filter means or returned to a source of said liquid for reuse through conduit means in communication with said outlet and said pump means, cleaning means disposed adjacent said filter means and engaging said portion of said filter means through which said liquid passes, and means to effect relative movement between said filter means and said cleaning means such that said cleaning means will remove contaminants and filter cake disposed on said filter means to permit reuse of said filter means.

13. An apparatus for filtering liquids such as cooking oils, shortening and the like, to remove particulate and chemical contaminants and eliminate odors, including a frame, container means mounted on said frame for receiving said liquid to be filtered and filter cake forming materials, said container means having an inlet and an outlet and a generally circular bowl with a side wall and a bottom wall, said inlet opening thereinto and baffle means to uniformly distribute the filter cake forming materials within said container preventing accumulation of these materials in the bottom of the container, said baffle means associated with said inlet at an angle such that said liquid to be filtered is directed by said inlet and said baffle means into said bowl at an angle generally parallel to said side wall to create a vortex effect within said bowl to uniformly distribute the filter cake forming materials within said container preventing accumulation of these materials in the bottom of the container, evenly distributing said liquid over filter means, pump means mounted on said frame in communication with said inlet and said outlet to circulate said liquid and filter cake forming material through said container, a generally vertical, hollow mounting tube disposed in said container, said mounting tube having openings formed therein to admit filtered liquid into the interior thereof, filter means to receive and retain the filter cake forming material circulated in said container mounted on said mounting tube and positioned within said container such that contaminated liquid introduced into said container is filtered through a portion of said filter means into said mounting tube to flow downwardly within said tube toward said outlet from where it may be recycled to said filter means or returned to a source of said liquid for reuse through conduit means in communication with said outlet and said pump means, cleaning means disposed adjacent said filter means and engaging said portion of said filter means through which said liquid passes, and means to effect relative movement between said filter means and said cleaning means such that said cleaning means will remove contaminants and filter cake disposed on said filter means to permit reuse of said filter means.

3,959,144

APPARATUS FOR BIOLOGICAL AND CHEMICAL PURIFICATION OF WATER BY AGGLOMERATION

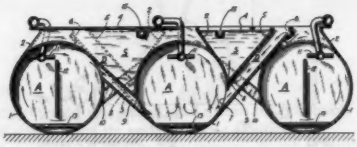
Svatopluk Mackrle, Brno, and Vladimir Mackrle, Prague, both of Czechoslovakia, assignors to Agrotechnika, narodny podnik, Zvolen, Czechoslovakia

Filed Nov. 15, 1974, Ser. No. 524,047

Int. Cl.² C02B 1/20; C02C 5/02

U.S. Cl. 210—201 **1 Claim**

1. An arrangement for biological and chemical purification of water by agglomeration, comprising at least two horizontal substantially aligned adjacently disposed tanks having elongated, substantially cylindrical jackets, a horizontally disposed vessel defining a separating space located between the upper parts of successive tanks, the tanks defining respective activating spaces therewithin, means for introducing raw water into the activating space within one of the tanks, conduit means with inclined walls connecting the upper portion of the activating space within one of the tanks with the lower portion of the activating space within the other of the tanks, the said inclined walls being generally tangential to the mantles of the said tanks, front and rear lateral walls closing the space within the conduit means determined by the inclined walls, a partition wall provided in the separating space above the inclined wall of at least one of the respective conduit means, the said partition wall determining, with said inclined wall, a degassing



space for the separation of gases from the cleaned water prior to its entrance into the separating space, the degassing space being connected by openings with the upper part of one activating space and by other openings with the lower part of an adjacent activating space and in addition by a slot with the separating space, the conduit means being connected with the inner space of the tanks and serving for separating the flocculer suspension, created in the course of purification of water, from the purified water, means for discharging purified water from the conduit means into the vessel, and means for collecting purified water in the upper part of the vessel.

3,959,145

MAGNETIC SEPARATOR WITH SCRAPER MEANS

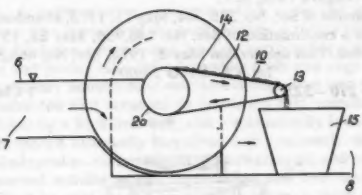
Bertil Lundquist, Vasteras; Harald Nilsson, Helsingborg, and Jorgen Zinck-Petersen, Vasteras, all of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Feb. 8, 1974, Ser. No. 440,872

Claims priority, application Sweden, Mar. 26, 1973, 7304194

Int. Cl.² B01D 35/06

U.S. Cl. 210—223 **8 Claims**



1. Magnetic separator comprising a rotatable shaft, a plurality of substantially parallel filter discs which are attached along said shaft and located in planes substantially perpendicular thereto with with gaps between the discs for passage of medium which is to be cleaned, said medium when entering the separator containing a ferromagnetic particulate material, said discs containing permanent magnets producing local magnetic field inhomogeneities in the gaps between the discs and the separator being provided with a scraper means for the particulate material which adheres to the discs when the medium passes the gaps, wherein the scraper means comprises a plurality of endless transport belts which enter the gaps between the discs and extend outside the discs, said separator having means to drive the shaft of the separator and the belts, said transport belts surrounding the separator shaft and having

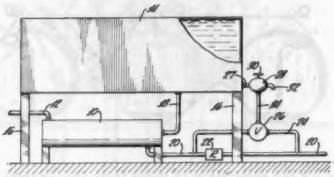
upper and lower runs, said upper runs moving outwardly with respect to the discs.

3,959,146

REVERSE OSMOSIS SYSTEM WITH AUTOMATIC FLUSHING

Donald T. Bray, Escondido, Calif., assignor to Desalination Systems, Inc., Escondido, Calif.

Filed Dec. 26, 1974, Ser. No. 536,339
Int. Cl.² B01D 31/00
U.S. Cl. 210—257 M 8 Claims



1. A reverse osmosis system comprising a membrane-containing module, means for introducing feed water under elevated pressure into said module, means including a flow control device for releasing concentrate from said module while maintaining operating pressure therein, and a tank for temporarily storing purified water produced by said module, said tank having dispensing means for dispensing purified water therefrom; in which the improvement comprises:

a. a by-pass pipe, having a normally closed valve therein, around said flow control device providing a direct, unrestricted connection between the concentrate outlet of said module and the outlet of said means for releasing said concentrate from said module; and

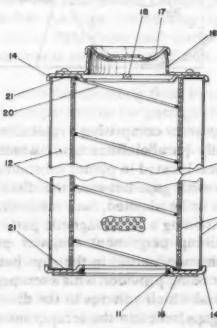
b. means for automatically opening and closing said valve in said by-pass pipe to flush water through said module concomitantly with delivery of purified water from said dispensing means.

3,959,147

FILTER ELEMENT ASSEMBLY

Harold C. Oakley, Lebanon, and James R. Sypitkowski, Indianapolis, both of Ind., assignors to The Carborundum Company, Niagara Falls, N.Y.

Continuation of Ser. No. 359,384, May 11, 1973, abandoned, which is a continuation of Ser. No. 146,950, May 26, 1971, abandoned. This application May 2, 1974, Ser. No. 466,366
Int. Cl.² B01D 23/00
U.S. Cl. 210—323 T 7 Claims



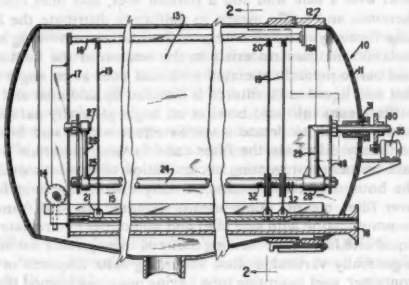
1. A filter cartridge, wherein the improvement comprises: an annular filter element; one end cap closing one end of said element; another annular end cap closing the other end of said element and having an axially inwardly offset inner peripheral portion, a substantially flat retaining ring forming with said inner peripheral portion an inwardly open annular channel, and annular elastic sealing means arranged in said channel.

3,959,148

ROTARY LEAF FILTER WITH INDEPENDENTLY MOVABLE SLUICE ARMS

John E. Krynski, East Moline, and Roland L. Laugel, Moline, both of Ill., assignors to Ametek, Inc., New York, N.Y.

Continuation of Ser. No. 327,228, Jan. 26, 1973, abandoned. This application July 11, 1974, Ser. No. 487,438
Int. Cl.² B01D 29/38, 29/24
U.S. Cl. 210—334 6 Claims



1. In a filter having a plurality of transverse filter leaf elements spaced along the axis of the filter, filter cake being depositable on the surfaces of said elements, the combination including a sluicing assembly comprising at least a pair of crank-shaped sluice arm means with longitudinally extending portions parallel to the axis of the filter and coextensive with the filter leaf elements, one of said arm means being on one side of said leaf elements and the other of said arm means being on the other side of said leaf elements, each arm means being mounted for pivotal oscillatory movement about an axis parallel to the axis of the filter, said sluice arm means and longitudinally extending portions being hollow and connected to a source of sluicing fluid, spray nozzles on said longitudinally extending portions positioned to direct sluicing fluid against and generally parallel to the faces of the filter leaf elements, so that sluicing fluid can be directed onto cake from either side of the filter and into filter cake on the surfaces of the leaf elements as a sluice arm means is pivoted so as to erode and remove filter cake thereon, independent drive means for each of said sluice arm means for pivoting the same when energized, and control means for energizing said drive means independent of each other and so that sluicing fluid from one side of said filter does not impinge on sluicing fluid from the other side of said filter whereby the sluicing fluid from each sluice arm as it sweeps said leaf elements will be unopposed by the sluicing fluid of the other sluice arm.

3,959,149
ISOCYANATE RESIN ABSORBENT FOR FREE CHLORINE, HEAVY METALS AND HEAVY METALLIC COMPOUNDS

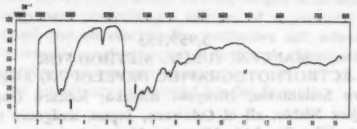
Nakaaki Oda; Yoshio Horie; Mitsuru Idohara, and Takeo Hukui, all of Takaoka, Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

Filed Aug. 25, 1971, Ser. No. 174,813

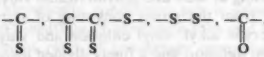
Claims priority, application Japan, Aug. 28, 1970, 45-74958; Sept. 21, 1970, 45-82005; Nov. 16, 1970, 45-100201; Dec. 29, 1970, 45-121310; July 14, 1971, 46-51688; June 12, 1971, 46-41418; Nov. 16, 1970, 45-100202; Dec. 29, 1970, 45-121309

Int. Cl.² B01J *1/08*

U.S. Cl. 260—77.5 R **1 Claim**



1. An adsorbent for chlorine, heavy metals or heavy metallic compounds, which comprises a resin prepared by reacting polyisocyanate with at least one compound selected from the group consisting of polyols and functional monomers which have at least 2 active hydrogen atoms and at least one functional group selected from the radical group consisting of



> NH and —N=, in a ratio of a total active hydrogen atom number in the polyol and functional monomer to a total isocyanate group number in the polyisocyanate of about 0.8 to about 5.0, said functional monomer being a compound selected from the group consisting of thiourea, urea, rubeanic acid, diphenylthiourea, dithiodiglycollic acid, and said polyisocyanate being a compound selected from the group consisting of toluylenediisocyanate (TDI), dimer or trimer of TDI, diphenylmethandiisocyanate (MDI) and TDI or MDI tar.

3,959,150
CYCLONE SEPARATOR ASSEMBLY

Rune Helmer Frykhult, Johanneshov, and Bo Knut Ek, Enskede, both of Sweden, assignors to AB Celleco, Tumba, Sweden

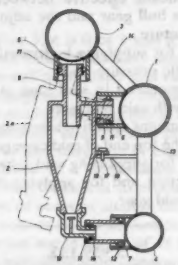
Filed Mar. 5, 1974, Ser. No. 448,215

Claims priority, application Sweden, Mar. 5, 1973, 73030108

Int. Cl.² B01D *21/36*

U.S. Cl. 210—512 M **3 Claims**

1. In combination with a plurality of cyclone separators, a manifold conduit for supplying fluid to the separators, and two additional manifold conduits for discharging separated fluids from the separators, means for releasably connecting each cyclone separator to said manifold conduits and including three tubular members on the separator, said means also including a tubular member on each of said conduits, each separator having an operating position in which a said tubular member on each of said conduits mates with one of said tubular members on the separator to form a pair of telescoping members extending lengthwise in substantially parallel relation one within the other, at least two of said tubular members on the separator being disposed generally perpendicularly relative to each other, one of said two tubular members forming with its mating member on the corresponding conduit an annular clearance space, an annular sealing member positioned in said annular space for accommodating tilting of the separator from its said operating position to move the other of said two tubular members away from its mating member on



the corresponding conduit, and means for releasably securing each separator in its said operating position.

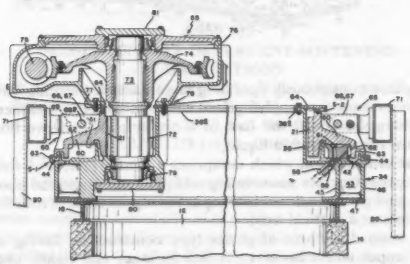
3,959,151
CONTINUOUSLY OPERATING SEDIMENTATION TANK WITH PIER SUPPORTED RAKE STRUCTURE

Bernard Liebowitz, Stamford, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 473,654, May 28, 1974, abandoned. This application Feb. 7, 1975, Ser. No. 547,820

Int. Cl.² B01D *21/18*

U.S. Cl. 210—528 **31 Claims**



1. A sedimentation apparatus which comprises a tank, a center pier rising from the tank bottom, a rotary rake structure having a vertical cage portion surrounding said center pier and having rake arms extending from said cage portion, a stationary annular base structure mounted on said pier, and constructed and arranged to provide a first annular trough defined by a high first wall, and a substantially lower second wall spaced outwardly therefrom and concentric therewith, and adapted to contain a bath of lubricating oil, and to provide a second annular trough surrounding said first trough, and defined by said second lower wall and by a third wall surrounding said second wall, said second trough having discharge passages for spent hydrostatic pressure fluid, a set of hydrostatic pressure bearing pads mounted in said second trough, constructed and arranged so as to provide horizontal hydrostatic supporting areas adapted to cooperate with an annular horizontal load bearing surface, and to provide vertical radially effective hydrostatic bearing areas cooperating with a conforming cylindrical area unitary and rotating with said horizontal annular area, for centering and stabilizing the same, an internally toothed bull gear having a lower portion lodging in the oil bath of said first trough of the annular base structure, said bull gear having an outwardly extending rim portion the underside of which is formed with an annular recess shaped to provide said annular load bearing surface and said cylindrical stabilizing surface, lower sealing means effec-

tive between the outer peripheral edge portion of said rim portion of the bull gear and the adjacent annular edge portion of said base structure,

upper sealing means effective between the annular top portion of the bull gear and the adjoining inner wall of said base structure,

pressure means for supplying hydrostatic pressure fluid to said hydrostatic pressure pads,

a drive pinion mounted in said base structure, in driving engagement with said bull gear,

and connecting means effective between said rim portion of the gear and the top end of said cage portion, constructed and arranged for supporting said rake structure through said cage portion and for applying thereto the driving torque from said gear.

3,959,152

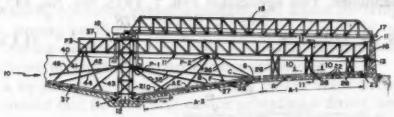
TRACTION-DRIVEN COMPOSITE SLUDGE RAKING MECHANISM FOR SEDIMENTATION TANKS

Jay A. Seifert, Stamford, Conn.; Donald R. Hill, Port Chester, and Michael Smith, Hartsdale, both of N.Y., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Continuation of Ser. No. 429,376, Dec. 28, 1973, abandoned. This application Mar. 17, 1975, Ser. No. 559,141

Int. Cl.² B01D *21/14*

U.S. Cl. 210—530 **16 Claims**



1. In a continuously operating large diameter settling tank having means for supplying feed slurry to the tank, sediment discharge means at the foot of a center pier, and overflow means for supernatant liquid,

the combination which comprises a center pier, a vertical cage structure surrounding said pier, and supported upon said pier by a thrust bearing at the top thereof for rotation about a vertical axis,

a main drive arm of girder type construction having an upper and a lower truss and its inner end rigidly connected to said cage structure to rotate therewith, and having, its outer end supported by a track for travel along the periphery of the tank,

means for propelling the outer end of said drive arm along said track, for rotation together with said cage structure,

a bladed rake arm extending from the lower end of said cage structure, and by its length defining the radius and extent of an inner bottom zone of sedimentation sludge accumulation around said pier, surrounded by an outer annular bottom sedimentation zone, with the outer end portion of said drive arm extending a significant distance beyond said inner zone and radially across said outer zone,

hinge means connecting the inner end of said bladed rake arm to the lower end of said cage structure, constructed and arranged so as to allow said rake arm to swing from a predetermined lowermost normal raking position rearwardly upwardly along a predetermined path, while preventing said rake arm from rotating about its own longitudinal axis,

a sloping guy wire connecting said rake arm with the upper end portion of said cage structure, and normally extending in a substantially vertical plane, said guy wire being effective to support the rake arm in said lowermost position relative to the tank bottom under normal sludge raking load conditions,

downwardly and rearwardly sloping draft means having its lower end connected to said rake arm, and its upper end connected to said drive arm by a drive connection whereby said drive arm and said rake arm are rotated together, said rake arm during such rotation being adapted to move the sludge in said inner zone towards said sludge discharge means, and to yield rearwardly upwardly along said predetermined path when overriding excessive sediment accumulation in said inner zone while resolving a sludge overload condition therein during continued rotation of the drive arm and rake structure,

and outer complementary raking means connected to said outer end portion of the drive arm, and constructed and arranged for moving relatively light sedimentation sludge load from said outer annular zone to said inner zone of sedimentation sludge accumulation.

3,959,153

MANUFACTURING METHOD FOR ELECTROPHOTOGRAPHIC DEVELOPING AGENT

Shigeru Sadamatsu; Hiroyuki Kaneko; Keitaro Ohe, and Daijiro Nishio, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 28, 1970, Ser. No. 41,647

Claims priority, application Japan, May 28, 1969, 44-41468

Int. Cl.² G03G *9/00*

U.S. Cl. 252—62.1 P **9 Claims**

1. In a manufacturing method for producing an electrophotographic developer comprising polymer particles by suspension polymerizing, in an aqueous phase, a polymerization liquid comprising at least one polymerizable vinyltype monomer selected from the group consisting of styrene, acrylic alkyl, methacrylic alkyl, vinyl chloride and vinyl acetate, a polymerization initiator, and a finely divided dispersion stabilizer either sparingly soluble or insoluble in water and said monomer, said polymerization liquid being blended prior to said suspension polymerization, the improvement comprising

adding to said polymerization liquid a resinous substance, as a fluidizer, soluble in the synthetic resin monomer and having a solubility parameter in the range of from 7.8 to 16.1, the addition ratio of said resinous substance to said vinyltype monomer being approximately 0.001% to 1%, said dispersion stabilizer being uniformly dispersed throughout said polymerization liquid during said blending, next suspending the blended polymerization liquid containing the fluidizer in said aqueous phase, and then subjecting the blend to said suspension polymerization

whereby the formation of said polymer particles having average particle diameters in the range of from 0.1 to 100 μ is effected during said suspension polymerization.

3,959,154

METHOD AND COMPOSITION FOR RETARDING THE EVAPORATION OF AMMONIA AND AMINES

Robert Powers Cox, 5428 Lake Mendota Drive, Madison, Wis. 53705

Filed Apr. 30, 1975, Ser. No. 573,270

Int. Cl.² G09K *3/00*

U.S. Cl. 252—1 **8 Claims**

1. A method of decreasing the rate of evaporation of ammonia or amines comprising the step of contacting an evaporable material selected from the group consisting of ammonia and amines with a compound having the formula:

$$R-(O-[CH_2]_y)_n-R'$$

where R is an alkyl group having from 8 to 30 carbon atoms, R' is —OH or —NH_2, y is an integer of 2 to 4 and n is an integer of 1 to 10.

3,959,155
DETERGENT COMPOSITION

Ronald E. Montgomery, Greenhills; William I. Mullane, Jr.; Francis L. Diehl, both of Wyoming, and James Byrd Edwards, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

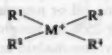
Filed Oct. 1, 1973, Ser. No. 402,504
Int. Cl.² C11D *10/04;* **D06M** *13/46, 13/52*
U.S. Cl. 252—8.8 **39 Claims**

1. A fabric softener and anti-static composition especially adapted for use in combination with anionic, zwitterionic and ampholytic surfactants, comprising:

a. from about 10% to about 99% by weight of a softening component comprising a smectite clay having an ultimate particle diameter of from about 150 anstroms to about 4500 angstroms; and

b. from about 1% to about 99% by weight of an anti-static component comprising a mixture of a quaternary compound and an electrically conductive salt wherein the electrically conductive salt is uniformly dispersed in the quaternary compound wherein:

i. the quaternary compound has the formula



wherein M is nitrogen or phosphorus, X is any anion, R^1 is a hydrocarbyl moiety, R^2 is hydrogen or a hydrocarbyl moiety, the total carbon content of $R^1 + R^2$ being at least 22 carbon atoms, and R^3 and R^4 are each hydrogen or hydrocarbyl moieties; and

ii. the electrically conductive salt is selected from the group consisting of aluminum salts and lithium salts,

at a weight ratio of quaternary compound:salt in said anti-static component in the range of 1000:1 to 1:5.

3,959,156
FABRIC SOFTENER

Peter M. Hay, Summit, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 422,535, Dec. 6, 1973, abandoned. This application Sept. 16, 1974, Ser. No. 506,232
The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.
Int. Cl.² D06M *13/26*
U.S. Cl. 252—8.8 **23 Claims**

1. A textile softening agent produced by reacting (A) the phosphate compound of the formula:

$$(BrCH_2—CHBrCH_2O)_3PO$$

with (B) the reaction product of (i) a fatty acid or an ester derivative thereof, wherein said fatty acid or ester derivative thereof is selected from the group consisting of:

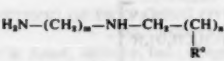
a. a saturated fatty acid of 12 to 22 carbon atoms, or a mixture thereof,

b. a lower alkyl (C_1–C_4) or glycerol ester of a saturated fatty acid of 12 to 22 carbon atoms, or a mixture thereof,

c. a mixture of at least one saturated fatty acid of 12 to 22 carbon atoms with one or more monounsaturated fatty acids of 14 to 22 carbon atoms, said mixture containing not more than 75% by weight of monounsaturated fatty acids,

d. a mixture of at least one lower alkyl (C_1–C_4) or glycerol ester of a saturated fatty acid of 12 to 22 carbon atoms with one or more lower alkyl (C_1–C_4) or glycerol esters of monounsaturated fatty acids of 14 to 22 carbon atoms, said mixture containing not more than 75% by weight of esters of monounsaturated fatty acids, and

e. mixtures thereof, and (ii) a diamine or mixture of diamines of the formula:



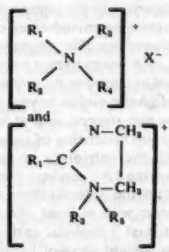
wherein m is 2 or 3, n is 0 or 1 and R^5 is hydrogen or hydroxy; the mol ratio of the fatty acid or ester derivative thereof expressed as the fatty acyl radical to the diamine being in the range of 1:1 to 3:1, subject to the proviso that the reaction product (i) and (ii) is substantially free of unreacted diamine, said reaction product produced by the reaction of said fatty acid or ester derivative thereof and said diamine at a temperature between 100° and 250°C. for a time sufficient to produce substantially the entire amount of water or alcohol theoretically indicated by the fatty acid or fatty ester/amide-forming condensation reaction but not in excess of 48 hours, said reaction product and said phosphate compound being reacted in a weight ratio of from 10:1 to 1.4:1 at a temperature between 30° and 150°C.

3,959,157
NON-PHOSPHATE DETERGENT-SOFTENING COMPOSITIONS

Jack Thomas Inamorato, Westfield, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

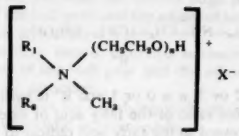
Filed June 4, 1973, Ser. No. 366,322
Int. Cl.² C11D *1/835;* **D06M** *13/46*
U.S. Cl. 252—8.8 **6 Claims**

1. A clear, stable liquid detergent composition free of phosphate and possessing detergent anti-static and softening properties consisting essentially of (a) about 10–40% by weight of a synthetic organic detergent selected from the group consisting of (1) a C_{16}–C_{22} alkyl-di C_1–C_3 alkyl amine oxide and (2) water soluble non-ionic surface-active compounds derived from the condensation of a C_6–C_{16} hydrophobic compound with from 5 to 200 moles of ethylene oxide and (3) mixtures of (1) and (2); and about (b) 3-15% by weight of a mixture of (1) a quaternary ammonium fabric softener selected from the group consisting of di-long chain and di- short chain quaternary ammonium compounds and mono or di- long chain alkyl imidazolinium compounds of the formulae:



and

wherein R_1 and R_2 are C_8–C_{22} alkyl radicals; R_3 and R_4 are C_1–C_4 alkyl; R_5 is C_1–C_4 alkyl or hydroxyalkyl, or C_8–C_{22} alkyl radical, and X is a water-soluble salt forming anion; and (2); a polyethoxylated quaternary ammonium compound containing from 10 to 60 moles of ethylene oxide of the formula:



wherein R_1 is C_8 to C_{22} radical, R_6 is C_8 to C_{22} radical, or $-(CH_2CH_2O)_nH$, X is an anion as above defined and n is a number from 10 to 60 in an aqueous solvent medium, the ratio of (a) to (b) ranging from 1:1 to 5:1 and the ratio of (b)1 to (b)2 ranging from 6:1 to 1:6.

3,959,158
HIGH TEMPERATURE CORROSION INHIBITOR FOR GAS AND OIL WELLS

James R. Stanford, Sugar Land, and George D. Chappell, Rosenberg, both of Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Sept. 3, 1974, Ser. No. 502,462
Int. Cl.² C23F *11/16, 11/04*
U.S. Cl. 252—8.55 E **9 Claims**

1. A corrosion inhibiting composition for gas and oil wells which comprises in weight percent about:

Primary fatty mono-amine where the carbon chain is C_8–C_{24}	5–50
Trimerized unsaturated fatty acid wherein each repeating unit contains between 12 and 24 carbon atoms	5–50
Alkaryl sulfonic acid where the alkyl portion has a carbon chain length of C_5–C_{18}	1–20
Lower alkanol dispersant wherein the carbon chain length is C_2–C_4 and aromatic solvent wherein the weight ratio of alkanol/aromatic solvent is about 1:10 to 10:1.	balance

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3,959,159
NITROGEN-CONTAINING MIXED ESTERS AND LUBRICANTS

Lester E. Coleman, Willoughby Hills, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 843,180, July 18, 1969, abandoned. This application Oct. 6, 1971, Ser. No. 187,205
The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.
Int. Cl.² C10M *1/32*
U.S. Cl. 252—51.5 A **16 Claims**

1. A lubricant or fuel composition comprising a major proportion of a lubricating oil or a normally liquid fuel and a minor proportion of an additive sufficient to impart viscosity index and dispersant properties to the composition, said additive being a nitrogen-containing mixed-ester of a carboxyinterpolymer having a reduced specific viscosity ranging from about 0.05 to about 2.0, said interpolymer being derived from the interpolymerization of at least one monomer selected from the group consisting of aliphatic olefins having from 2 to about 8 aliphatic carbon atoms and styrene, and at least one monomer selected from the group consisting of an α,β-unsaturated aliphatic carboxylic acid, the anhydride or an ester thereof; and said interpolymer having (A) pendant carboxylic-mixed-ester groups derived from the esterification of the carboxy groups of the interpolymer with at least one high molecular weight alcohol having at least 7 aliphatic carbon atoms and at least one low molecular weight alcohol having from 1 to 6 aliphatic carbon atoms, and (B) pendant carbonyl-polyamino groups derived from the reaction of the carboxy groups of the interpolymer with hydrazine or a hydrocarbon-substituted hydrazine; wherein the molar ratio of (A):(B) is in the range of from about 2:1 to about 50:1.

12. A lubricant or fuel composition comprising a major proportion of a lubricating oil or a normally liquid fuel and a minor proportion of an additive sufficient to impart viscosity index and dispersant properties to the composition, said additive being a nitrogen-containing mixed-ester of a carboxyinterpolymer having a reduced specific viscosity ranging from about 0.05 to about 2.0; said interpolymer being derived from the interpolymerization of at least one monomer selected from the group consisting of aliphatic olefins having from 2 to about 8 aliphatic carbon atoms and styrene, and a monomer selected from the group consisting of maleic acid, the anhydride, or an ester thereof; said interpolymer having (A) pendant carboxylic-mixed-ester groups derived from the esterification of about 50 to about 98 molar percentage of the carboxy groups of the interpolymer with about 60 to 90 molar percentage of an alcohol having from 7 to about 24 aliphatic carbon atoms, and with about 10 to about 40 molar percentage of an alcohol having from 1 to 6 carbon atoms, and (B) pendant carbonyl-polyamino derived from the reaction of the remaining carboxy groups of the interpolymer with hydrazine or a hydrocarbon-substituted hydrazine; wherein the molar ratio of (A):(B) is in the range of from about 2:1 to about 50:1.

14. A lubricant or fuel composition comprising a major proportion of lubricating oil or normally liquid fuel and from about 0.001% to about 25% by weight of a nitrogen-containing mixed-ester of a styrene-maleic acid interpolymer having a reduced specific viscosity ranging from about 0.05 to about 2.0, the interpolymer having (A) carboxylic-mixed-ester groups derived from the esterification of from about 50 to about 98 molar percentage of the carboxy groups of the interpolymer, with about 60 to about 90 molar percentage of an alcohol having from 7 to about 24 aliphatic carbon atoms, and with about 10 to about 40 molar percentage of an alcohol having 1 to 6 aliphatic carbon atoms, and (B) pendant carbonyl-polyamino groups derived from the reaction of the remaining carboxy groups of the interpolymer with hydrazine or a hydrocarbon-substituted hydrazine; wherein the molar ratio of (A):(B) is in the range of from about 2:1 to about 50:1.

3,959,160
AEROSOL SHAVING FOAM COMPOSITIONS

Christopher Horsler, Amersham, and John Piercy, Leek, both of England, assignors to Wilkinson Sword Limited, Great Britain

Filed May 13, 1974, Ser. No. 469,052
Int. Cl.² C11D *17/00*
U.S. Cl. 252—90 **7 Claims**

1. A shaving foam package comprising a pressurized dispenser equipped with a dispensing head and valve and containing therein a foam-forming composition consisting essentially of (A) an aqueous concentrate containing (*i*) from 1.5–15% by weight, based on the weight of the concentrate, of one or more water soluble or substantially water soluble synthetic anionic-compatible surfactants; (*ii*) from 0.5 to 6.0% by weight, based on the weight of the concentrate, of one or more water insoluble long chain fatty alcohols; and (*iii*) from 2–12% by weight, based on the weight of the concentrate, of an anionic surfactant selected from alkali metal or alkanolamine soaps, i.e. salts of fatty acids containing from 10–22 carbon atoms, long chain alkyl and alkaryl sulphates and ether sulphates, long chain alkyl and alkaryl sulphonates, long chain N-acyl sarcosinates, and mixtures of two or more thereof the anionic surfactant constituting (*iii*) being of a different type from that constituting component (*i*) when the latter is itself anionic, the balance of the concentrate being water; and emulsified therewith (B) a normally gaseous propellant in liquid phase; the weight ratio of total surfactant, i.e. components (*i*) and (*iii*) together, to long chain fatty alcohol being from 1:1 to 20:1 and the weight ratio of total synthetic surfactant plus long chain fatty alcohol, to soap, when said anionic surfactant is or contains soap, being in the range 0.5:1 to 4:1.

3,959,161

LUBRICATING OIL COMPOSITIONS CONTAINING HYDROGENATED POLYBUTADIENE VISCOSITY INDEX IMPROVERS

Francois Dawans, Bougival; Emmanuel Goldenberg, Poissy, and Jean-Pierre Durand, Chatou, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

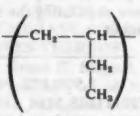
Filed Feb. 21, 1974, Ser. No. 444,283

Claims priority, application France, Feb. 22, 1973, 73.06418

Int. Cl.² C10M *1/16*

U.S. Cl. 252—59 9 Claims

1. A lubricating composition comprising a major amount of lubricating oil and 1-6% by weight of said lubricating oil of a viscosity-index-improving amount of an at least partially hydrogenated butadiene polymer having an average molecular weight (by weight) of 30,000–200,000 and a microstructure comprising from 65 to 85% of



units from 2 to 35% of $—CH_2—C_2—CH_2—CH_2—$ units and from 0 to 25% of $—CH_2—CH=CH—CH_2—$ units.

3,959,162

INSULATING OIL

Mineaki Nishimatsu, Kyoto; Sadayoshi Mukai, Katano, and Kaname Ishida, Kyoto, all of Japan, assignors to Nissin Electric Co., Ltd., Kyoto, Japan

Filed Aug. 2, 1974, Ser. No. 494,342

Claims priority, application Japan, Aug. 20, 1973, 48-93181

Int. Cl.² H01B *3/18*; H01F *27/02*

U.S. Cl. 252—63.7 11 Claims

1. An insulating oil composition for use in electrical devices, comprising trixylenylphosphate and from 10% to 40% by volume of insulating oil having a viscosity of 5 cp to 15 cp at 30°C.

3. An insulating oil composition for use in electrical devices, comprising trixylenylphosphate and from 10% to 40% by volume of a mixture of a plurality of insulating oils having a viscosity of 5 cp to 15 cp at 30°C.

11. The composition of claim 3, wherein said plurality of insulating oils are selected from the group consisting of mineral oils, alkylbenzenes, alkylnaphthalenes, 2-diphenylmethylether, 2-diphenylisopropylether, paraffin hydrocarbon oils and naphthene hydrocarbon oils.

3,959,163

STAIN REMOVAL

George Thomas Farley, Piscataway, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Sept. 18, 1972, Ser. No. 289,647

Int. Cl.² C11D *7/38*

U.S. Cl. 252—99 6 Claims

1. A fabric bleaching composition consisting essentially of stabilized diperisophthalic acid and a water-soluble nonionic detergent selected from the group consisting of (a) C_{16}-C_{18} alkanols condensed with about 5 to 15 moles of ethylene oxide and (b) an ether of polyethylene glycol and a blend of C_{16}-C_{18} alcohols, containing about 60% or 65% ethylene oxide the weight ratio of diperisophthalic acid to nonionic detergent being bout 0.2:1 to 1:1.

3,959,164

METHOD OF PREPARING OVERBASED BARIUM SULFONATES

Albert R. Sabol, Munster, Ind., assignor to Standard Oil Company, Chicago, Ill.

Filed Dec. 20, 1972, Ser. No. 316,879

Int. Cl.² C10M *1/40*

U.S. Cl. 252—33 3 Claims

1. The process for preparing over-based oil-soluble barium alkenyl sulfonates comprising: heating a mixture comprising (a) ammonium alkenyl sulfonate wherein the alkenyl moiety is a propene or butene polymer having a number average molecular weight of about 250–500, (b) an amount of an anhydrous precarbonated mixture of barium oxide in methanol sufficient to provide about 1–6 mols of barium per mol of said sulfonate, (c) a stoichiometric amount of barium oxide to convert said sulfonate to barium sulfonate, and (d) about 0.5–1.5 mols water per mol of barium in mixture at a temperature of about 160°–190°F for a period of time sufficient to convert said ammonium sulfonate to barium sulfonate; and removing methanol, water and unreacted material from the mixture whereby said over-based barium alkenyl sulfonates are obtained.

3,959,165

BIODEGRADABLE, NON-POLLUTING, HEAVY DUTY SYNTHETIC ORGANIC DETERGENT COMPOSITION

Joseph A. Yurko, Bayonne, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Sept. 15, 1972, Ser. No. 289,652

Int. Cl.² C11D *9/10*

U.S. Cl. 252—109 9 Claims

1. A readily biodegradable non-polluting heavy duty phosphate free synthetic organic detergent composition characterized by excellent laundering ability in hard and soft waters for low temperature as well as high temperature washing, without causing yellowing and which leaves the laundry softened, which comprises from 5 to 25% of a higher C_{10}-C_{20} alkane sulfonate synthetic oganic detergent, 1 to 5% of nonionic detergent, 1 to 5% of a higher C_{12}-C_{18} fatty acid soap, 5 to 20% of sodium silicate of a Na_2O:SiO_2 ratio in the range of 1:1.6 to 1:.2.8, 40 to 75% of a carbonate selected from the group consisting of alkali metal carbonate and bicarbonates with the major proportion thereof being alkali metal carbonate, 0.5 to 4% of an anti-redeposition agent, and 1 to 20% of moisture.

3,959,166

CLEANER FOR AUTOMOTIVE ENGINE COOLING SYSTEM

Alfred W. Oberhofer, Downers Grove, Ill.; James J. Benko, Griffith, Ind., and Joseph C. Drozd, Park Ridge, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Dec. 16, 1974, Ser. No. 533,355

Int. Cl.² C11D *7/32*; C09K *15/00*

U.S. Cl. 252—146 14 Claims

1. An extended life liquid cleaner for automotive cooling systems comprising from 15–85% by weight of water and from 85–15% by weight of a composition consisting essentially of

A. An aminopolycarboxylic acid

B. An α hydroxy carboxylic acid

C. An azole copper protector selected from the group consisting of mercaptobenzothiazole and a monobenzotriazole

with the ratio of A:B:C being within the range of from 3:1:1 to 2:1:1, said liquid cleaner having an alkaline pH.

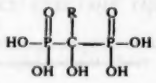
3,959,167

METHOD AND COMPOSITION OF INHIBITING SCALE

Chih Ming Hwa, Palatine; Dionisio Guerrero Cuisia, Chicago, and Murrell Leon Salutsky, Highland Park, all of Ill., assignors to Chemed Corporation, Cincinnati, Ohio

Filed Dec. 10, 1973, Ser. No. 423,610
Int. Cl.² C02B 5/02
U.S. Cl. 252—180 12 Claims

1. A method for inhibiting deposits of scale, sludge and other foulants in aqueous systems, said method consisting essentially of adding to the said systems of 0.01 to 500 parts per million of a mixture of 0.1 to 100 parts by weight of an acrylic polymer selected from the group consisting of polymethacrylic acid and polyacrylic acid and water-soluble salts thereof, said polymer having a weight average molecular weight of from about 1,000 to 1,000,000; 0.1 to 100 parts by weight of a water-soluble chelant selected from the group consisting of nitrilotriacetic acid and its water soluble salts, ethylenediamine tetraacetic acid and its water soluble salts; and 0.1 to 100 parts by weight of hydroxyalkylidene diphosphonic acid having the structural formula of



wherein R denotes an alkyl group having from 1 to 5 carbon atoms, and water-soluble salts thereof.

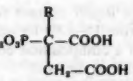
3,959,168

SYNERGISTIC SEQUESTERING AGENT COMPOSITIONS

Hans Günther Germscheid, Hosel, Germany; Hans-Rüdiger Kranick, Nairobi, Kenya; Hans-Jörgen Rehm, Hilden, Germany; Rolf Scharf, Monheim, Germany, and Hans-Joachim Schlüsser, Dusseldorf-Holthausen, Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed May 8, 1974, Ser. No. 468,214
Claims priority, application Germany, May 22, 1973, 2325829
Int. Cl.² C02B 5/00
U.S. Cl. 252—180 4 Claims

1. A synergistic sequestering agent composition consisting essentially of a first component selected from the group consisting of (a) 1-hydroxyethane-1,1-diphosphonic acid and its alkali metal and ammonium salts, (b) aminotrimethylenephosphonic acid and its alkali metal and ammonium salts and (c) mixtures of (a) and (b), and a second component selected from the group consisting of phosphonic acids having the formula



wherein R is a member selected from the group consisting of hydrogen, methyl and $-CH_2-$ CH_2 — COOH, their alkali metal and ammonium salts and mixtures thereof, said first component and said second component being present in a ratio of from 8:1 to 1:8.

3,959,169

WATER SOLUTION OF QUATERNARY AMMONIUM ALKENE HALIDE

Walter G. Hunt, Bridgeton, Mo., and Leslie P. Kovats, Granite City, Ill., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed Sept. 21, 1973, Ser. No. 399,286
Int. Cl.² C09K 3/00
U.S. Cl. 252—182 10 Claims

1. A method of making a water solution of an amine alkene halide comprising the steps of reacting a dihaloalkene and a tertiary amine of the formula:

wherein R_1, R_2 and R_3 are from the group consisting of alkyl, substituted alkyl, alkene, aryl, or aralkyl in the presence of a solvent which is non-polar as compared to water, adding water to the reaction mixture, separating the solvent, and recovering the water based product.

3,959,170

CORROSION INHIBITORS FOR ALKANOLAMINE GAS TREATING SYSTEM

Blake F. Mago, New City, and Charles W. West, Niagara Falls, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 201,131, Nov. 22, 1971, Pat. No. 3,808,140, which is a continuation-in-part of Ser. No. 54,595, July 13, 1970, abandoned. This application Nov. 2, 1973, Ser. No. 412,502
Int. Cl.² C23F 11/18; B01D 47/02; C01B 31/20
U.S. Cl. 252—189 13 Claims

1. A corrosion inhibited composition consisting essentially of an aqueous alkanolamine solution employed in acid gas removal service and an inhibiting amount of a stannous salt or mixtures thereof, said inhibiting amount being about 0.01 to about 2.0 percent based upon the weight of said aqueous alkanolamine solution.

3,959,171

OPTICAL FILTER FOR NEODYMIUM LASER LIGHT

Richard Forrest Woodcock, South Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Aug. 1, 1974, Ser. No. 493,588
Int. Cl.² G02B 5/22
U.S. Cl. 252—300 5 Claims

1. An optical filter for laser radiation comprising a base glass containing from 1–75 weight percent of an oxide base of a compound producing Er^{3+} ions and 1–20 weight percent of an iron compound soluble in the glass melt producing Fe^{2+} ions, said ions being uniformly distributed throughout said base glass, and said glass being characterized by high visual transmittance and color transmittance in the human eye range.

3,959,172

PROCESS FOR ENCAPSULATING RADIONUCLIDES

Lloyd E. Brownell, and Raymond E. Isaacson, both of Richland, Wash., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 26, 1973, Ser. No. 401,090
Int. Cl.² G21F 9/24
U.S. Cl. 252—301.1 W 2 Claims

1. A method of immobilizing radionuclides in virtually an insoluble form comprising the steps of drilling a deep main well into a subterranean zone of weathered basalt, forming a sealant casing around the circumference of the entire main well shaft, drilling at least four additional wells into said basalt

zone, said additional wells being at a deeper depth than said main well shaft and being in a square pattern around said main well shaft, pumping a strong hydrochloric acid solution into said main well, thereby leaching aluminum, iron and calcium from said basalt and forming a large cavern at the bottom of said main well, injecting a water wash into said main well, adding sufficient caustic to dissolve silica accumulated at bottom of said cavern to thereby form silica gel, and pumping a solution of said radionuclides into said main well, whereby said radionuclides will combine with free aluminum and silicate ions to crystallize out in the form of insoluble complex metalo-silicates.

3,959,173

NOVEL LIQUID MEMBRANE FORMULATIONS AND USES THEREOF

Norman N. Li, Edison; Gopal H. Singhal, Westfield; Richard M. Minday, North Plainfield, all of N.J., and Martin L. Gorbaty, Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed July 29, 1974, Ser. No. 492,616

Int. Cl.² B01J *13/00*

U.S. Cl. 252—309 **10 Claims**

1. A water-in-oil emulsion comprising (a) an ethylene vinyl alkanoate copolymer, wherein the alkanoate group has from 1 to 20 carbons, comprising at least 25% by weight ethylene and (b) a solvent for said copolymer as the oil phase of the emulsion, the solvent having a boiling point of greater than 85° C and selected from the group consisting of petroleum distillates and paraffinic solvents including paraffinic solvents bearing substituents selected from the group consisting of halogen and aromatics.

3,959,174

METHOD OF SELECTIVELY PRODUCING HIGH PORE VOLUME SILICA GEL

Milton E. Winyall, Ellicott City, and Ellsworth G. Acker, Baltimore, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 174,524, Aug. 24, 1971, abandoned, which is a continuation-in-part of Ser. No. 71,966, Sept. 14, 1970, abandoned. This application Jan. 10, 1973, Ser. No. 322,570

Int. Cl.² B01J *13/00*; **C01B** *33/14, 33/16*

U.S. Cl. 252—317 **25 Claims**

1. The method of selectively producing a high pore volume silica gel comprising:

a. forming a first aqueous solution having a definite alkali metal silicate concentration and a water soluble silica desolubilizing agent concentration, said silica desolubilizing agent functioning to decrease the solubility of silica in water and being selected from the group consisting of ammonia, monohydric alcohols, glycols, ketones and salts;

b. adding an acid so as to reduce the pH to about 11.2 to 10.6 thereby forming a silica hydrosol;

c. allowing said silica hydrosol to set to a silica hydrogel;

d. aging said silica hydrogel for about 2 to 120 minutes;

e. neutralizing said silica hydrogel by adding an acid to reduce the pH to a pH of about 10 to 3; and

f. washing and recovering the high pore volume silica gel product.

3,959,175

DEFOAMER CONTAINING LIQUID POLYBUTENE

Richard L. Smith, Jr., 5703 Westhill Circle, College Park, Ga. 30022, and Joseph W. Johns, Jr., 8403 Attleboro Drive, Jonesboro, Ga. 30236

Continuation of Ser. No. 294,221, Oct. 2, 1972, abandoned, which is a continuation of Ser. No. 115,099, Feb. 12, 1971, abandoned. This application Sept. 11, 1974, Ser. No. 505,141

Int. Cl.² B01D *19/04*

U.S. Cl. 252—321 **16 Claims**

1. A method of defoaming an aqueous system which comprises adding polybutene having a molecular weight of 200–3000 to said system.

3,959,176

NON-FOAMING DISPERSING COMPOSITION

Frederick R. Mahn, Verona, and Emil A. Ippolito, Chatham, both of N.J., assignors to Drew Chemical Corporation, Parsippany, N.J.

Filed Sept. 9, 1974, Ser. No. 504,099

Int. Cl.² B01F *17/00, 17/30, 17/16*; **B01D** *17/00*

U.S. Cl. 252—352 **13 Claims**

1. A solid non-foaming dispersing composition for dispersing contaminants in aqueous and polar organic systems, comprising:

a. hydrophobic silica;

b. a block copolymer of polyoxyethylene and polyoxypropylene wherein both ends of the block copolymer chain is polyoxypropylene, and

c. a water insoluble organic spreading liquid, said components (a), (b), and (c) being present in an amount to provide a solid composition, effective to disperse contaminants in aqueous and polar organic systems without foaming.

3,959,177

MULTIFUNCTIONAL CORROSION INHIBITORS

Richard L. Martin, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Dec. 7, 1973, Ser. No. 422,750

Int. Cl.² C23F *11/16*

U.S. Cl. 252—389 A **8 Claims**

1. A corrosion inhibiting composition comprising (1) 1,2-dithiole-3-thiones or quaternaries thereof and (2) thiophosphates containing both oxygen and sulfur, pyrophosphates containing both oxygen and sulfur, or mixtures thereof.

3,959,178

MIXED HYDROCARBYLOXIDE TREATED CATALYST ACTIVATED AT DIFFERENT TEMPERATURES

John P. Hogan, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 28, 1974, Ser. No. 455,740

Int. Cl.² C08F *4/24*

U.S. Cl. 252—430 **9 Claims**

1. A process for producing a mixed catalyst comprising:

activating in dry air at least one first supported chromium oxide portion at a first temperature within the range of 500° to 1100°F;

activating in dry air at least one second supported chromium oxide portion at a second temperature within the range of 1200° to 2000°F, said second temperature being at least 200°F above said first temperature;

said activating steps being sufficient to convert at least a substantial portion of the chromium to the hexavalent state;

thereafter combining said thus activated first and second portions to form a composite, the weight ratio of said first portion to said second portion being within the range of 1:6 to 12:6, and treating said thus formed composite, or said activated portions prior to combination, with from 0.5 to 10 weight percent, based on the weight of said

composite or activated portion being treated of a hydrocarbyl aluminum hydrocarbyloxide.

3,959,179

DESULFURIZATION CATALYSTS

Richard J. Mikovsky, Trenton, N.J., and Anthony J. Silvestri, Morrisville, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 23, 1974, Ser. No. 504,467

Int. Cl.² B01J *29/06, 23/16;* **C01F** *7/02*

U.S. Cl. 252—455 Z **15 Claims**

1. A hydrodesulfurization catalyst comprising at least one oxide of a metal selected from a Group VIB and a metal selected from Group VIII of the Periodic Table incorporated with a refractory base, said catalyst being prepared by impregnating the said base with a solution of a soluble compound of each of said metals in a non-aqueous polar solvent, drying said impregnated base and calcining the dried impregnated base.

10. The catalyst of claim **1** wherein said base is prepared by precipitating said hydroxide of the base from an aqueous solution of a soluble salt thereof, refluxing the resulting precipitated hydroxide of said base with a non-aqueous polar solvent, drying said refluxed hydroxide of said base; and calcining the refluxed and dried hydroxide of said base.

14. An alumina suitable for use as a base for metal-containing components in the preparation of catalysts prepared by the steps of Claim **10**, comprising precipitating aluminum hydroxide from an aqueous solution of a soluble aluminum salt, filtering the precipitated aluminum hydroxide and refluxing said precipitated and filtered aluminum hydroxide; with a non-aqueous polar solvent, drying the refluxed alumina hydroxide; and calcining the refluxed and dried aluminum hydroxide.

3,959,180

METHOD FOR CATALYST PREPARATION

Clarence W. Bittner, Orinda, and Walter G. Schlaffer, San Francisco, both of Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 23, 1975, Ser. No. 543,590

Int. Cl.² B01J *29/06, 29/00, 29/10*

U.S. Cl. 252—455 Z **8 Claims**

1. A method for preparing a crystalline aluminosilicate zeolite catalyst having a nickel content of 15–30%w and a Group VI-B metal content of 0.05 – 6%w which method comprises

A. Heating a solid hydrated water soluble nickel salt of a strong inorganic acid to a temperature from about 60° to about 100°C to form a solution of said salt in its own water of crystallization,

B. Dissolving in said solution a tungsten compound in an amount sufficient to provide an atomic ratio of nickel to tungsten in the range of from about 8:1 to 2,000:1,

C. Contacting at a temperature from about 60° to about 110°C an amount of the product of step B corresponding to approximately ±10pcv of the total available pore volume of the zeolite with calcined stabilized zeolite having a silica:alumina molar ratio between about 2 and 10 so as to fill about the total available pore volume of said zeolite,

D. Drying the composite, and

E. Calcining the composite for at least about 30 minutes at a temperature from about 450° to 600°C.

3,959,181

CATALYSTS

Hiepke Boerma, Vlaardingen, Netherlands, assignor to N.V. Internationale Octrooi Maatschappij "Octropa", Rotterdam, Netherlands

Filed Dec. 12, 1972, Ser. No. 314,396

Claims priority, application Netherlands, Dec. 17, 1971, 7158625

Int. Cl.² B01J *29/10, 29/20*

U.S. Cl. 252—459 **4 Claims**

1. An alkaline precipitation process for preparing a kieselguhr supported nickel catalyst in which an aqueous solution of a nickel salt, an aqueous solution of an alkali metal carbonate and an alkali metal hydroxide, said solution containing, by weight of the hydroxide, at least 10% of the carbonate, and kieselguhr are mixed to form a suspension that, throughout the precipitation,

a. is within a 5°C. temperature range within the range of 75° to 100°C.,

b. is at a pH of 8.0 to 10.0, and

c. has an alkalinity greater than 0.010N to give a catalyst with a weight ratio of nickel to SiO_2 between 0.5 and 3.0.

3,959,182

CATALYST COMPOSITIONS AND PROCESS FOR PRODUCING ACRYLIC ACID OR METHACRYLIC ACID UTILIZING SUCH CATALYST

Shoichi Izawa; Isao Ono; Tetuo Iikuni, and Kiyoto Nishida, all of Yamaguchi, Japan, assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 851,429, Aug. 19, 1969, abandoned. This application July 20, 1973, Ser. No. 381,335

Int. Cl.² B01J *23/16, 23/64*

U.S. Cl. 252—467 **11 Claims**

1. A process for the production of an oxidation catalyst which comprises incorporating at least one organic compound selected from the group consisting of carboxylic acids, alcohols, amines, esters and quinones into intimate admixture with the essential components of a molybdenum salt or oxide and vanadium salt or oxide oxidation catalyst and calcining the said admixture at a temperature in the range of 330°C to 430°C, said organic compounds having a boiling point of at least 150°C at the pressure utilized for the calcining step and being water-soluble or forming an aquasol or an aquagel in the presence of water.

3,959,183

METHOD OF MAKING CATALYTIC STRUCTURES FOR TREATING GASES

Reinhard Gospodar, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Dec. 20, 1972, Ser. No. 316,839

Claims priority, application Germany, Dec. 21, 1971, 2163536

Int. Cl.² B01J *35/02*

U.S. Cl. 252—477 R **10 Claims**

1. A method of manufacturing a catalytic unit for treatment of gases passing through a flowpath, comprising the steps of:

forming discrete catalytic support particles into a unitary gas-porous structure of a cross-sectional size generally coextensive with that of the flowpath by closely packing said particles into a gas-porous mass and rigidly bonding together at points on the surfaces thereof at least those of said particles located adjacent the periphery of said mass of particles while maintaining the porosity of said mass; and

prior to or after the bonding step, coating the particles with an active catalytic agent.

3,959,184
MODIFIED COPPER-ALUMINUM SUPPRESSOR ELEMENT

Joseph Nemeth, St. Clair Shores, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Apr. 8, 1974, Ser. No. 458,776
Int. Cl.² H01T *13/00*; H01B *1/06*; H01C *1/06*
U.S. Cl. 252—521 **2 Claims**

1. A green ceramic article useful after firing as an electrical suppressor element, said article consisting essentially of copper oxide, alumina and a modifier which is a compound of M, where M is a metal carbonate selected from the group consisting of magnesium, calcium, strontium and barium wherein the relative proportions of the modifier and of alumina are such that the atom ratio of M to Al is from about 0.5:1 to 2.0:1, wherein the proportions of the copper oxide, alumina and modifier are such that the numerical value of the atom ratio Cu/(Al + M) is from about 0.5 to 4.0, and wherein the temperature coefficient of resistance of the fired suppressor which is defined by the expression

$$n = 2.303 \log \frac{(R_2)}{(R_1)} \quad \frac{(1)}{(T_2 - T_1)} \times 100 \text{ in } \%/^{\circ}C$$

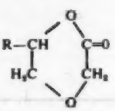
is between about −0.1%/°C and −1.0 %/°C, depending upon the value of the Cu/(M + Al) atom ratio.

3,959,185
PERFUME BLEND INCLUDING 2-KETO-6-SUBSTITUTED-DIOXANES-(1,4)

Joseph Barillo, Glen Rock; Thomas A. Payne, Jr., Teaneck, and Warren J. Urban, River Vale, all of N.J., assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 452,229, March 18, 1974, abandoned. This application Mar. 3, 1975, Ser. No. 554,940
Int. Cl.² A61K *7/00*, *7/46*, *7/50*
U.S. Cl. 252—522 **5 Claims**

1. A perfume blend including an olfactorily effective amount of a compound having the formula:



wherein R is R'OCH_2— wherein R' is an alkyl radical of from C_5–C_8.

3,959,186
PROCESS FOR MANUFACTURING DETERGENT BUILDERS

Dominic Richard Harris, Mount Waverley, Australia, assignor to ICI Australia Limited, Melbourne, Australia

Filed June 3, 1974, Ser. No. 475,915
Claims priority, application Australia, June 19, 1973, 3758/73
Int. Cl.² C11D *1/14*, *1/831*, *11/04*
U.S. Cl. 252—551 **8 Claims**

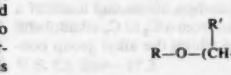
1. A process of manufacturing detergent builders which comprises:

1. treating a compound A of general formula I with from 0.5 to 3 moles of sulphating agent per mole of compound A under sulphating conditions:

(I)

wherein R is a straight chain alkyl or alkenyl group containing from 8 to 20 inclusive carbon atoms substituted in the 2 position with either a methyl group or hydrogen atom, R' is a hydrogen atom, or a methyl group or a mixture of hydrogen and methyl, Y is H; and *n* is selected from the range from 8 to 25 inclusive;

2. adding to the reaction mixture after sulfation in Step (1) has ceased a compound B of general formula II and treating the mixture under sulphating conditions until sulfation has ceased



(II)

wherein R, R', Y is as defined hereinabove and *m* is selected from the range 2 to 12 inclusive and wherein *n* minus *m* is greater than 3; and

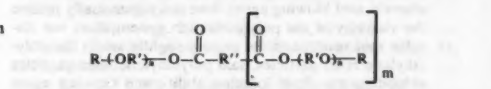
3. neutralizing residual sulphating agent, the weight ratio of compound A to compound B being in the range from 3 : 7 to 7 : 3.

3,959,187
MIXED SYNTHETIC ESTER LUBRICANTS AS USEFUL POLYMERIC FIBER LUBRICANTS

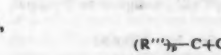
Arie Dick Kardol; Adrianus Trapman, both of Waddinxveen, and Gijsbert van der Waal, Bergambacht, all of Netherlands, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed Dec. 19, 1974, Ser. No. 534,249
Claims priority, application United Kingdom, Dec. 28, 1973, 60077/73
Int. Cl.² C10M *1/24*
U.S. Cl. 252—56 S **5 Claims**

1. A synthetic ester lubricant characterized by having good thermal stability and emulsifiability in water comprising 25–45 % by weight of a polycarboxylic acid ester obtained from a poly(C_3–C_3) alkoxylated lower C_1–C_6 alkyl alcohol and a polycarboxylic acid containing 2–4 carboxyl groups and 20–80 carbon atoms and having the formula



wherein R represents a C_1–C_6 alkyl group, R' represents a C_2–C_3 alkylene group, *n* represents an integer from 4–20, R'' represents a hydrocarbon group containing 20–80 carbon atoms and *m* represents an integer from 1–3, said polycarboxylic acid ester having an acid number and hydroxyl value less than 20, and 55–75% by weight of a monocarboxylic acid ester corresponding to the structural formula



in which R'''' represents an alkyl group containing 6–12 carbon atoms, R''' represents an alkyl group containing 1–4 carbon atoms and *p* and *q* represent whole numbers from 0–2 and 2–4, respectively, with the proviso that *p*+*q*=4, said monocarboxylic acid ester having an acid number and hydroxyl value less than 8.

3,959,188

SURFACTANTS AND THEIR USE IN FOAMABLE POLYMER COMPOSITIONS

David John McBriar; Harry Charles Murfitt, both of Stockton-on-Tees, England, and Robert Edward Bohun, Melbourne, Australia, assignors to Imperial Chemical Industries Limited, London, England

Filed July 19, 1974, Ser. No. 490,191

Claims priority, application United Kingdom, July 19, 1973, 34469/73

Int. Cl.² C08J 9/30

U.S. Cl. 260—2.5 P 7 Claims

1. A foamable composition which comprises a homo- or co-polymer of vinychloride, an ethoxylate containing 5 to 20 ethylene oxide units of an alkylphenol comprising one or more alkyl groups containing 5 to 15 carbon atoms and a salt of a mono- or di-alkanolamine derived from a C_2 to C_8 alkanol and an alkylbenzene sulfonic acid in which the alkyl group contains 10 to 14 carbon atoms.

3,959,189

PROCESS FOR PRODUCING POLYETHYLENE RESIN PARTICLES AND FOAMABLE POLYETHYLENE RESIN PARTICLES

Yoshiaki Kitamori, Nara, Japan, assignor to Sekisui Kaseihin Kabushiki Kaisha, Nara, Japan

Filed Dec. 20, 1973, Ser. No. 426,752

Int. Cl.² C08J 9/00

U.S. Cl. 260—2.5 B 15 Claims

1. A process for producing foamable polyethylene resin particles which comprises the steps of:

a. suspending in an aqueous medium polyethylene resin particles having an MI value of 0.3 to 10, a density of less than 0.93 g/cm³ and a softening point below 85°C;

b. adding to said aqueous suspension of (a) a cross-linking agent for cross-linking said polyethylene resin particles;

c. adding to said aqueous suspension of (b) 30 to 100% by weight based on the weight of said particles of a styrene monomer and a catalyst for polymerizing said monomer;

d. cross-linking said polyethylene resin particles and polymerizing said monomer in the interior of said polyethylene resin particles; and

incorporating, after the polymerization, a blowing agent into the resulting cross-linked polyethylene resin particles which contain a polystyrene resin formed by the polymerization of said styrene monomer at a temperature below the softening point of said polyethylene resin particles, wherein said blowing agent does not substantially reduce the viscosity of the polymerization system, does not dissolve said resin particles or only slightly swells the polyethylene resin particles, said polyethylene resin particles exhibiting excellent foaming ability and blowing agent retention.

3,959,190

INSOLUBLE OXIDATION REAGENT

Ned M. Weinshenker, Palo Alto, Calif., assignor to Dynapol, Palo Alto, Calif.

Filed June 17, 1974, Ser. No. 479,654

Int. Cl.² C08J 9/36; C08F 28/04

U.S. Cl. 260—2.5 HB 7 Claims

1. A polymeric sulfur reagent comprising a solid organic solvent-insoluble macroreticular cross-linked polystyrene resin backbone having lower alkyl sulfide groups covalently attached directly to carbon atoms thereof through thioether linkages.

3,959,191

NOVEL HYDROPHOBIC POLYURETHANE FOAMS

Clifton L. Kehr, and Nelson S. Marans, both of Silver Spring, Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 322,666, Jan. 11, 1973, abandoned.

This application Dec. 30, 1974, Ser. No. 537,617

Int. Cl.² C08G 18/10, 18/14, 5/19

U.S. Cl. 260—2.5 AD 8 Claims

1. A method for preparation of hydrophobic polyurethane foam which comprises, reacting the condensation prepolymer of polyisocyanate and essentially water-insoluble polyalkylene ether polyol or essentially water-insoluble polyalkylene ester polyol with large amounts of an aqueous reactant while in the presence of a catalyst and an emulsifying agent, maintaining an emulsion during foaming of the reactants, the water content of the aqueous reactant being about 35% to about 90% by weight based on the weight of the total composition to be foamed, the emulsifying agent being present in an amount of about 0.25 to about 10 parts per 100 parts of the condensation prepolymer and selected from the group consisting of fatty acyl sarcosine, fatty alkyl sarcosine, acyl-iminodiacetic acid, alkyl-iminodiacetic acid and condensates of ethylene oxide with a hydrophobic base, the catalyst being present in an amount of about 0.05% to about 3% by weight of the condensation prepolymer and selected from the group consisting of 3-morpholinopropionamide, 2-(diethylamino) acetamide, 2-methyl-3-(diethylamino)propionamide, triethylene diamine, N-lower alkyl morpholine, N,N,N′N′-tetramethylethylene diamine, N,N,N′N′-tetramethyl-1,3-butane-diamine, N,N-diethylcyclohexylamine trimethylamine formate, trimethylamine acetate, triethylamine formate, triethylamine acetate, N-methylmorpholine acetate, N-methylmorpholine citrate, trimethylamine ethylenediamine tetraacetate, trimethylamine imino-triacetate, stannous octoate, stannous oleate, dibutyltin dilaurate, dibutyltin and di-2-ethylhexoate, and the said polyalkylene ether polyol or polyalkylene ester polyol having a weight average molecular weight of about 200 to about 20,000 and a hydroxyl functionality ranging from about 2 to about 8 hydroxyl groups per molecule, the ratio in the condensation prepolymer of isocyanate groups in the polyisocyanate to the hydroxyl groups being between about 1 to about 4 isocyanate to hydroxyl molar ratio, and recovering a hydrophobic polyurethane foam.

3,959,192

USE OF ULTRAFINE NATURAL CALCIUM CARBONATES AS FILLERS IN NATURAL AND SYNTHETIC POLYMERS

Pierre Delfosse, Paris, France, and Alfred Bosshard, Oftringen, Switzerland, assignors to Pluss-Staufer Ag, Switzerland

Continuation of Ser. No. 401,497, Sept. 27, 1973, abandoned.

This application Mar. 7, 1975, Ser. No. 556,371

Claims priority, application Germany, Feb. 26, 1973, 2309516; Oct. 18, 1972, 2251099

Int. Cl.² C08J 9/00; C08K 3/26

U.S. Cl. 260—2.5 R 8 Claims

1. A filled polymer, the filler comprising ultrafine natural calcium carbonate having an average statistical particle diameter of from 0.5 to 0.7 μ and a maximum diameter of from 3 to 4 μ.

3,959,193

UTILIZATION OF CELLULOSE ACETATE BUTYRATE AND ARYL SULFONAMIDE-FORMALDEHYDE RESIN CONTAINING DISPERSANT

Edgar N. Putman, New Hope; George Patterson, Philadelphia; Scotty Wimer, Bethlehem, and John B. McCool, 3rd, Ottsville, all of Pa., assignors to PFD/Penn Color, Inc., Doylestown, Pa.

Filed Mar. 12, 1973, Ser. No. 340,453
Int. Cl.² C08L 1/14
U.S. Cl. 260—15 4 Claims

1. A method of utilizing a cellulose acetate butyrate containing dispersant composition to disperse a resin additive into a given resin system, comprising the steps of:

a. providing a given weight of resin additive dispersant composition consisting essentially of cellulose acetate butyrate, aryl sulfonamide-formaldehyde resin, and a non-ionic surfactant, said surfactant comprising up to 1%, by weight, of said composition, the remainder of said composition comprising:

i. said cellulose acetate butyrate, and

ii. said aryl sulfonamide-formaldehyde resin in a weight ratio range (ratios of (i) to (ii)) from 80:20 to 30:70;

b. mixing said resin additive into said resin additive dispersant composition in a ratio of from ⅜ to 9 times said given weight of resin additive dispersant composition, to produce a dispersed resin additive composition; and

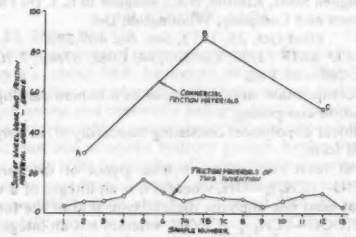
c. dispersing the dispersed resin additive composition in a given resin system selected from the group consisting of solution grades of polyvinylchloride, polyvinylacetate, polyvinylchloride copolymer, polyvinylacetate copolymer, thermoplastic rubber, polyurethanes, polyolefins, and solution grades of polyamides.

3,959,194

LESS ABRASIVE COMPOSITION RAILROAD BRAKE SHOE MATERIAL

John Charles Adelmann, Littleton, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation of Ser. No. 302,464, Oct. 31, 1972, abandoned. This application May 7, 1975, Ser. No. 575,306
Int. Cl.² C08K 3/34; C08L 1/02; F16D 69/02
U.S. Cl. 260—17.2 7 Claims



6. An improved low abrasion lead free friction material comprising in approximate per cent by weight:

curable rubber binder	8 – 20%
phenolic resin	2 – 5%
lead-free inorganic filler	35 – 60%
lead-free organic filler	15 – 45%
fiber	2 – 12%.

3,959,195

FRACTIONATED SAWDUST CHIPBOARD AND METHOD OF MAKING SAME

Erik Gustav Lennart Eriksson, Karlstad, Sweden, assignor to AB Karlstadplattan, Karlstad, Sweden

Continuation-in-part of Ser. No. 136,774, April 23, 1971, abandoned. This application June 13, 1974, Ser. No. 478,952
Claims priority, application Sweden, Apr. 24, 1970, 5740/70
Int. Cl.² C08L 1/02
U.S. Cl. 260—17.3 10 Claims

1. A method of making chipboard from substantially 100% sawdust, the method comprising separating particles of sawdust, of length less than about 10 mm, of width no greater than 4.75 mm and of thickness no greater than the width, the ratio of the length to thickness being less than about 15, into two fractions a first of which contains particles of width and/or thickness less than about 1 mm and a second of which contains particles of width and/or thickness from about 1.0 mm to about 4.75 mm, slicing the particles in the second fraction to reduce the width and/or thickness thereof to from 0.5 mm to about 2.375 mm with the length of each particle in the direction of its grain remaining substantially unchanged and with the ratio of particle length to thickness increased but less than about 30, combining said first fraction and said sliced fraction, fractionating the combined fractions into at least two fractions one of which is relatively fine and the other relatively coarse, said relatively fine fraction containing particles from about 0.71 mm to less than about 1.4 mm width and/or thickness and said relatively coarse fraction containing particles from about 1.4 mm to about 2.375 mm width and/or thickness, further fractionating said relatively fine fraction into two additional fractions, treating the sawdust fractions with a binding agent, and feeding the thus treated relatively fine and relatively coarse fractions to a forming device.

3,959,196

ALKANOL AMINE NEUTRALIZED POLYOXYALKYLATED EPOXY FATTY ESTER BINDING AGENTS

Arie Dick Kardol, Waddinxveen, and Johannes Helmond, Gouda, both of Netherlands, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed Aug. 23, 1974, Ser. No. 499,813
Claims priority, application United Kingdom, Aug. 23, 1973, 39983/73
Int. Cl.² C08L 63/02; C08G 59/22; C08K 5/20
U.S. Cl. 260—18 EP 7 Claims

1. A binding agent comprising per molecule a center consisting of a polycarboxylic acid to each carboxyl group of which a diepoxide has been attached and the terminal epoxy groups of which bear an alkoxy polyoxyalkylene group and dialkanol ammonium group neutralized by carboxylate ions obtained by reacting a dimer, trimer or higher oligomer obtained by the polymerization of unsaturated C_{16}–C_{20} fatty acids with one mol (per carboxylic group) of a diglycidyl ether of a compound selected from the group consisting of Bisphenol A, Bisphenol F and polyoxypropylene glycol, further reacting with about 0.5 to 1.5 mols of an alkoxy polyoxyalkylene compound having terminal alkoxy and hydroxyl groups, a molecular weight from about 200 to 400 and alkylene groups containing 2 or 3 carbon atoms and 0.5 to 1.5 moles of an alkanol amine the alkanol groups of which contain 2 or 3 carbon atoms and finally neutralized to a pH of 4-9 with a monocarboxylic acid containing 1 to 4 carbon atoms.

3,959,197
USE OF SOLVENT MIXTURES IN MAKING FOAMABLE COMPOSITIONS

Ival O. Salyer; James L. Schwendeman, both of Dayton, Ohio, and Robert T. Jefferson, Columbus, Ind., assignors to Monsanto Research Corporation, St. Louis, Mo.

No Drawing. Continuation-in-part of Ser. No. 406,993, Oct. 16, 1973, abandoned, which is a continuation of Ser. No. 201,145, Nov. 22, 1971, abandoned, which is a continuation-in-part of Ser. No. 877,459, Nov. 17, 1969, abandoned. This application Sept. 6, 1974, Ser. No. 503,903

Int. Cl.² C08J *9/16*; C08K *5/01*, *5/02*, *5/15*

U.S. Cl. 260—2.5 E **26 Claims**

1. A process for rapidly producing a substantially uniform, solid, cellular thermoplastic article comprises the steps of:

a. charging a vessel with

1. a solid thermoplastic amorphous polymer having a solubility parameter between 8.4 and 10.4 and an intrinsic viscosity between 0.5 and 5,
2. a solvent mixture the major amount of which in the range of from about 25–50% by weight of said polymer boils at or below 0°C. and to prevent shrinkage the minor amount of which in range of from about 3–30% by weight of said polymer boils at or near 20°C., said solvent mixture being capable of forming a gel with the polymer when subjected to super-atmospheric pressure,
3. water in sufficient amount to lubricate the flow of the gel from the vessel as specified in step (c) below, and
4. for homogeneous polymer solutions a nucleating agent selected from the group consisting of glass hollow spheres, phenolic hollow spheres and mixtures thereof;

b. subjecting the contents of the vessel to superatmospheric pressure while at a temperature within the range of room temperature to below the critical temperature of said solvent mixture for time sufficient to form a flowable gel; and,

c. thereafter rapidly opening an outlet at the bottom of the vessel to cause the gel to flow from the vessel and form the cellular article.

3,959,198
PROCESS FOR THE MANUFACTURE OF HEAT-CURABLE SYNTHETIC RESINS WHICH CAN BE DILUTED WITH WATER AND ARE SUITABLE FOR THE ELECTROPHORETIC COATING PROCESS

Bernhard Broecker, Hamburg, and Richard Schardt, Oststeinbek, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed May 15, 1974, Ser. No. 469,956

Claims priority, application Germany, Mar. 9, 1974, 2411418

Int. Cl.² C08L *91/00*

U.S. Cl. 260—23.7 A **16 Claims**

1. Process for the manufacture of a heat-curable synthetic resin based on a reaction product of maleic anhydride with a mixture of polybutadiene, an unsaturated hydrocarbon resin and an unsaturated fatty acid glyceride ester, which can be diluted with water and is suitable for the electrophoretic coating process wherein a mixture consisting of:

a. 20–60% by weight of a polybutadiene having an average molecular weight of 750–2,000 and an iodine number between 300 and 450,

b. 10–60% by weight of a hydrocarbon resin of predominantly aliphatic structure, having a viscosity between 30 and 800 cP, measured in 70% strength solution in toluene at 20°C and an iodine number of between 160 and 400, consisting of

b_1. 20–80% by weight of polyisoprene,

b_2. 5–35% by weight of cyclopentadiene and/or dicyclopentadiene, and

b_3. 5–50% by weight of further mono-unsaturated or poly-unsaturated hydrocarbons with 5–6 C atoms which are of predominantly aliphatic or cycloaliphatic structure, and

c. 5–40% by weight of a fatty acid glyceride ester, wherein each fatty acid radical contains 16–18 C atoms and the fatty acid glyceride ester has an iodine number between 140 and 220,

is pre-polymerized by heating to 200°–270°C until the reaction mixture of components (a), (b) and (c), which has an initial viscosity of about 100 to 300 sec., measured according to DIN 53,211, displays a viscosity between 500 and 2,000 sec., measured according to DIN 53,211, the resulting mixture is then reacted with

d. 10–20% by weight of maleic anhydride at 180° to 190°C until no further free maleic anhydride is present, and

e. in the resulting adduct, the anhydride groups present are opened by hydrolysis with water or alcoholysis with the amount of monohydric alcohols with 1–4 C atoms required to form the half-ester,

characterized in that the reaction is carried out to modify the process product by co-using as component (f), 5 to 25% by weight, relative to the total weight of the components (a), (b), (c) and (d), of an adduct of an α,β-unsaturated aliphatic dicarboxylic acid to a resin acid or such an adduct which is partially or completely esterified with a polyhydric saturated aliphatic alcohol.

3,959,199
PLASTIC VARNISH COATING WITH INTEGRAL SELF-PROTECTING FORMULATION AND PROCESS FOR PRODUCING THE SAME

Carlos Dubinovsky Mandel, Cerrada Ceylan 529 "F", Mexico City, Mexico (15)

Filed Oct. 24, 1973, Ser. No. 409,187

Claims priority, application Mexico, Sept. 24, 1973, 146350

Int. Cl.² C08L *91/08*

U.S. Cl. 260—28.5 R **1 Claim**

1. A plastic weather resistant outdoor varnish coating with integral self-protecting formulation consisting of from about 55 to 90% by weight of an aqueous dispersion of a plastic varnish, selected from the group consisting of homopolymers or copolymers of polyvinyl acetate, and from about 10 to 45% by weight of an emulsion containing about 20% of a synthetic wax, about 12% of a micro-crystalline wax, about 6% paraffin, about 8% oleic acid, about 3% morpholine, suitable amounts of diacetonic alcohol, a disinfectant, ethyleneglycol, ammonia, an antifoaming agent, a thickening agent, calcium carbonate as a neutralizer, and the balance water.

3,959,200
COPOLYESTER COMPOSITION

Paul Thigpen Scott, Kinston, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 25, 1973, Ser. No. 409,596

Int. Cl.² A61F *11/00*; C08K *5/54*; C08L *67/02*, *77/00*

U.S. Cl. 260—29.1 SB **8 Claims**

1. A composition suitable for use as a human earplug, the composition comprising

A. a linear copolyester consisting essentially of, in polymerized form,

1. at least one polymethylene glycol of the formula $HO-(CH_2)_n-OH$, wherein n is an integer of 2 to 6,
2. at least one aliphatic dicarboxylic acid of the formula $HOOC-(CH_2)_x-COOH$, wherein x is an integer of 3 to 8, and
3. about 10 to 50 mol percent of the total amount of acid in the copolyester of isophthalic acid;

the copolyester having

4. an intrinsic viscosity of about 0.3 to 0.8,
5. a degree of crystallinity less than about 10%, as determined by X-ray diffraction, and
6. a polymer melt temperature of 20°C to 45°C;

B. up to 1% of a silicone oil; and

C. up to 1% of fibers.

3,959,201

HIGH SOLIDS, WATER THINNABLE COMPOSITIONS

Wen-Hsuan Chang, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 301,034, Oct. 26, 1972. This application Oct. 11, 1973, Ser. No. 405,713

Int. Cl.² C08L 61/28

U.S. Cl. 260—29.4 R 19 Claims

1. An aqueous, high solids coating composition substantially devoid of salt solubilizing groups comprising:

A. a vehicle blend comprising:

1. from about 20 to about 80 percent by weight of a hydroxyl-containing organic material, said organic material having a molecular weight of 1000 or less and being selected from the group consisting of non-nitrogen containing polyols, amide group containing polyols, hydroxyl-containing acrylates, and hydroxyl-containing methacrylates, wherein said organic material contains no more than two alkylene oxide groups per hydroxyl group and has a room temperature water thinnability of 3 or more parts of water per 100 parts of organic material, said organic material being further characterized by an average hydroxyl equivalent weight between about 40 and about 500 and an oxygen plus nitrogen to carbon ratio of not less than 1:5; and

2. from about 80 to about 20 percent by weight of an aminoplast resin; and

B. aqueous solvent, wherein at least 10 percent by weight of the solvent is water, said coating composition characterized by a solids content of at least about 70 percent.

3,959,202

COMPOSITION OF MATTER COMPRISING A BLEND OF CERTAIN POLYETHER POLYOLS, CERTAIN VINYL EMULSION POLYMERS AND AN AMINOPLAST CROSS-LINKING AGENT

Werner Josef Blank, Wilton, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 460,416, April 12, 1974, which is a continuation-in-part of Ser. No. 331,406, Feb. 12, 1973, abandoned. This application Sept. 8, 1975, Ser. No. 611,093

Int. Cl.² C08L 61/28

U.S. Cl. 260—29.4 UA 11 Claims

1. A composition of matter comprising a blend of (A), from about 3 to about 98%, by weight, of a water-dilutable, non-ionic polyether polyol resin having only carbon, hydrogen and oxygen atoms and optionally halogen atoms, having an average molclar weight between about 300 and about 2,000, having at least two alcoholic hydroxy groups, having from about 80 to about 10%, by weight, of hydrophobic moieties derived at least in part from aromatic or cycloaliphatic materials and correspondingly from about 20 to about 90%, by weight, of hydrophilic moieties consisting of —(CH_2—CH_2—O—) units; (B), correspondingly from about 97% to about 2%, by weight, solids basis, of an aqueous vinyl emulsion polymer having a particle size between about 600 A and 50,000 A, contaning from about 1% to about 179 10%, by weight, of functional reactive groups selected from the group consisting of hydroxy, carboxyl, amide keto, metylol and alkoxymethyl groups and (C) from about 10% to about 85%, by weight, based on the total weight of (A and (B), of a compatible aminoplast cross-linking agent having an average molecular weight not greater than about 1,500.

3,959,203

MODIFIED UNSATURATED POLYESTER COMPOSITIONS

Joseph W. Keil, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Oct. 15, 1974, Ser. No. 514,689

Int. Cl.² C08K 5/01, 5/24

U.S. Cl. 260—29.1 SB 15 Claims

1. A dispersion consisting essentially of

A. from 50 to 99.45 percent by weight of an unsaturated polyester resin,

B. from 0.5 to 40 percent by weight of a material selected from the group consisting of liquid organopolysiloxanes, siloxane copolymers composed of SiO_2 and $R_3SiO_{1/2}$ units wherein R is a hydrocarbon radical containing from 1 to 6 carbon atoms and the ratio of SiO_2 units to $R_3SiO_{1/2}$ units is in the range of 1:0.4 to 1:1.2, and liquid polyolefins, and

C. from 0.05 to 10 percent by weight of a dispersing agent which maintains (B) dispersed in (A), said dispersing agent being a siloxane copolymer selected from the group consisting of

1 copolymers consisting essentially of SiO_2 units, $(CH_3)_3SiO_{1/2}$ units and $D(CH_3)_2SiO_{1/2}$ in which D is a polyoxyethylene polymer having a molecular weight of at least 2000, or a polyoxyethylene-polyoxypropylene copolymer having a molecular weight of at least 2500 and the polyoxypropylene portion constitutes up to 50 mole percent of the organic portion of the copolymer, said D being attached to the silicon atom via a silicon-carbon bond, the ratio of the SiO_2 units to the total $(CH_3)_3SiO_{1/2}$ and $D(CH_3)_2SiO_{1/2}$ units being in the range of 1:0.4 to 1:1.2,

2 copolymers which are reaction products derived from heating a mixture of a siloxane consisting essentially of SiO_2 units and $(CH_3)_3SiO_{1/2}$ units in which the ratio of SiO_2 units to $(CH_3)_3SiO_{1/2}$ units is in the range of 1:0.4 to 1:1.2, and a hydroxylated polyoxyethylene polymer having a molecular weight of at least 2000 or a hydroxylated polyoxyethylene-polyoxypropylene copolymer having a molecular weight of at least 2500 and the polyoxypropylene constitutes up to 50 mole percent of the organic portion of the copolymer,

3 polydimethylsiloxane-organic copolymers in which the polydimethylsiloxane portion has a molecular weight of at least 2000 and the organic portion consists essentially of a polyoxyethylene polymer having a molecular weight of at least 800, or a polyoxyethylenepolyoxypropylene copolymer having a molecular weight of at least 1500 and the polyoxypropylene constitutes up to 50 mole percent of the organic portion of the copolymer said organic portion being attached to silicon atoms via silicon-carbon bonds, and

4 polydimethylsiloxane-organic copolymers which are reaction products produced by heating a mixture of hyroxylated polydimethylsiloxanes having a molecular weight of at least 1500, and a hydroxylated polyoxyethylene polymer having a molecular weight of at least 800, or a hydroxylated polyoxyethylene-polyoxypropylene copolymer having a molecular weight of at least 1500 and the polyoxypropylene constitutes up to 50 mole percent of the organic portion of the copolymer.

3,959,204

LATEX STABILITY BY ADDITION OF FLUORIDE SALTS

Edwin Reed Dunn, Port Huron, Mich., assignor to Polysar Limited, Sarnia, Canada

Filed Mar. 21, 1974, Ser. No. 453,645

Int. Cl.² C08L 9/08

U.S. Cl. 260—29.7 PT 12 Claims

1. In a method for rendering an unstable latex composition more resistant to destabilization, said latex composition com-

prising a mixture of a latex and a finely ground calcium carbonate filler, said filler containing soluble calcium and magnesium ion salts as impurities, and said latex containing an anionic emulsifier as latex stabilizer, the step of adding about 0.2 to 5 parts by weight of soluble fluoride salt per hundred parts by weight of latex solids to said latex to precipitate said soluble calcium and magnesium ions.

3,959,205

PREPARATION OF AQUEOUS EMULSION

Koichi Kobayashi, and Akihito Kimura, both of Ibaraki, Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sept. 3, 1974, Ser. No. 502,357
Claims priority, application Japan, Jan. 19, 1973, 48-9050
Int. Cl.² C08L 9/10
U.S. Cl. 260—29.6 RW **4 Claims**

1. In a process for preparing an emulsion of a polymer comprising at least one monomer unit selected from the group consisting of acrylates, methacrylates and butadiene monomers by emulsion polymerization in the presence of an emulsifier in an aqueous medium, the improvement which comprises employing as the emulsifier hydrolyzed vinyl acetate-alkali metal olefinsulfonate copolymer prepared by copolymerizing vinyl acetate and an alkali metal salt of olefinsulfonic acid selected from the group consisting of ethylenesulfonic acid, allylsulfonic acid and 2-methylallylsulfonic acid in the molar ratio of 99.5:05 to 93:7 in the absence of a solvent or in the presence of a lower alkyl alcohol solvent having 1 to 4 carbon atoms in an amount of not more than 40% by weight of the total weight of polymerization system and then hydrolyzing the resultant copolymer, said hydrolyzed vinyl acetate-alkali metal olefinusulfonate copolymer having 0.5 to 7% by mole of alkali metal olefinsulfonate unit and a degree of hydrolysis in vinyl acetate unit of at least 65% by mole.

3,959,206

HIGH MOLECULAR WEIGHT BUTADIENE-STYRENE LATEX CAN END SEALANT COMPOSITION

Henry M. Singleton, Dallas, Tex., assignor to The Southland Corporation, Dallas, Tex.

Filed Oct. 21, 1974, Ser. No. 516,811
Int. Cl.² C08L 9/08
U.S. Cl. 260—29.6 RW **12 Claims**

1. An aqueous based, substantially volatile organic solvent-free can-sealing composition setable at ambient temperatures and consisting essentially, in addition to the aqueous vehicle, expressed in parts by weight of:

a. about 17.5 to about 24.5 parts of high molecular weight styrene-butadiene rubber (SBR) having a Mooney (ML) viscosity at 212°F of 100-150 and a bound styrene content of 20-30%,

b. about 35 to about 55 parts of an inert filler having a particle size of at most about 2 microns and selected from the group consisting of calcium carbonate, titanium dioxide, aluminum silicate, magnesium silicate, lamp black and mixtures thereof;

c. 0.1 to about 2.0 parts antioxidant for said SBR, said antioxidant selected from the group consisting of butylated hydroxy anisole, styrenated butylated paracresol and butylated hydroxy toluene;

d. about 0.9 to about 1.5 parts of an anionic wetting agent, and

e. from 0.08 to about 0.4 parts of a polyacrylic acid salt as thickening agent, said sealant composition adjusted to an overall pH in the range of about 8.0 to about 10.0.

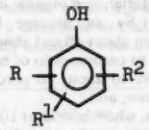
3,959,207

LATEX VISCOSITY DEPRESSANTS

William L. Cox, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 107,487, Jan. 18, 1971, abandoned.
This application Jan. 31, 1973, Ser. No. 328,212
Int. Cl.² C08C 1/00; C08L 7/02, 9/10
U.S. Cl. 260—29.7 E **14 Claims**

1. A polymer latex wherein the polymer is selected from the group consisting of natural rubber, homopolymers of conjugated 1,3-diene monomer, and copolymers of conjugated 1,3-diene monomer with at least one copolymerizable monomer selected from the group consisting of vinyl monomers and vinylidene monomers, said copolymers containg up to 50 percent by weight of the copolymerizable monomer, said polymer latex having an original latex viscosity of at least 500 centipoises having incorporated therein 0.25 to 3.0 parts by weight of a liquid phenolic viscosity depressant per 100 parts by weight of polymer in the polymer latex said phenolic viscosity depresssant having the following structural formula



wherein R, R^1 and R^2 are selected from the group consisting of hydrogen and alkyl radicals having from 1 to 24 carbon atoms and wherein the sum of the carbon atoms in R, R^1 and R^2 is from 14 to 32 carbon atoms wherein the liquid depressant is in emulsion form.

3,959,208

FRICTION MATERIAL CONTAINING SPINEL AS FRICTION MODIFIER

Yehuda Baskin, South Euclid, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed Feb. 7, 1975, Ser. No. 548,014
Int. Cl.³ C08J 5/14; C08K 7/08
U.S. Cl. 260—38 **15 Claims**

1. In friction material containing a fibrous reinforced, rigid, thermosetting, heat-resistant, organic resin and a friction modifier, the improvement comprising a crystalline mineral friction modifier consisting essentially of a particulate normal spinel present in an amount of about 0.8% to about 45% by weight of said friction material and having the formula:

XY_2O_4

in which X represents two atoms of a monovalent metal selected from the group consisting of Na, K, Ag, and Li, or one atom of a divalent metal selected from the group consisting of Mg, Fe, Co, Mn, Zn, Ni, Cu, and Cd, and Y s a trivalent metal selected from the group consisting of Mo, Al, Ni, Fe, Cr, Mn, Ti, and V, except that X and Y cannot both be the same metal.

3,959,209

CURABLE SOLID POLYESTER RESINS

Robert D. Lake, Monroeville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Apr. 11, 1973, Ser. No. 349,932
Int. Cl.² C08L 67/06
U.S. Cl. 260—40 R **52 Claims**

1. A process for preparing a solid curable polyester resin composition comprising:

A. mixing solid particles of an ethylenically unsaturated crystalline polyester with an ethylenically unsaturated liquid crosslinking agent wherein said polyester is insoluble in said crosslinking agent at room temperature,

thereby forming a mixture which contains said solid particles of said crystalline polyester;

B. heating said mixture containing said solid particles of said crystalline polyester and liquid crosslinking agent to a temperature at which said solid particles of said crystalline polyester dissolves in said crosslinking agent and a temperature which is below that at which the polyester and crosslinking agent cure, thereby forming a heated liquid solution of said polyester and said crosslinking agent;

C. forming an uncured solid solution of said polyester and crosslinking agent by cooling the heated solution thereof; and

D. mixing with the polyester and crosslinking agent prior to the formation of said solid solution one or more of a filler or fibrous reinforcements, thereby impregnating said filler or fibrous reinforcements or mixture thereof with said heated liquid solution; and to thereby provide a solid curable polyester resin composition in which said filler or said fibrous reinforcements or said mixture thereof is thoroughly impregnated with said solid solution.

3,959,210

ACRYLATE ADHESIVE COMPOSITION

Tatyana Esperovna Lipatova, ulitsa Vladimirskaya, 51/53, kv. 22; Roman Alexandrovich Veselovsky, Kharkovskoe shosse, 21/3, kv. 179; Ljudmila Ivanovna Chirkova, ulitsa Krasnotkatskaya, 20, kv. 9, and Boris Artemievich Lyashenko, ulitsa Vystavochnaya, 2, kv. 82, all of Kiev, U.S.S.R.

Filed Feb. 20, 1974, Ser. No. 444,115

Int. Cl.² C08K *3/00;* **C08L** *33/08, 79/03;* **C09J** *3/14*

U.S. Cl. 260—42.13 **10 Claims**

1. An adhesive composition comprising 100 to 110 parts by weight of a 30 to 50% solution of a polyacrylate in an acrylate solvent, 10 to 60 parts by weight of the product of interaction of allyl alcohol with an aromatic diisocyanate and benzoyl chloride, said interaction product being formed by a starting composition containing in molar ratio from 0.9 to 1.1 of said allyl alcohol, from 0.9 to 1.1 of said aromatic diisocyanate, and from 0.005 to 0.015 of said benzoyl chloride, 0.1 to 10 parts by weight of a fluorinated alcohol of the general formula $C_nF_{2n+1}OH$ in which n is 5 to 15, and 0.1 to 3 parts by weight of a polymerization agent selected from the group consisting of a polymerization initiater and a polymerization catalyst.

3,959,211

BLENDS OF A POLYPHENYLENE ETHER RESIN AND ALKENYL AROMATIC RESINS MODIFIED WITH EPDM RUBBER

Glenn D. Cooper, and Visvaldis Abolins, both of Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 401,986, Oct. 1, 1973. This application Dec. 19, 1974, Ser. No. 534,379

Int. Cl.² C08K *3/00, 7/14*

U.S. Cl. 260—42.18 **6 Claims**

1. A thermoplastic molding composition which comprises:

a. from 20–65% by weight of a polyphenylene ether resin;

b. from 35–80% by weight of an alkenyl aromatic resin that is modified with a rubbery interpolymer which comprises 10–90 mole percent of ethylene, 10–90 mole percent of an alpha-olefin having from 3–10 carbon atoms, and from 0.1–10 mole percent of a polyene that is a non-conjugated cyclic or open chain diene that has from 5–10 carbon atoms by polymerizing an alkenyl aromatic monomer in the presence of said rubbery interpolymer; and

c. a reinforcing amount of an inorganic reinforcing filler.

3,959,212

RADIO-OPAQUE DENTAL RESTORATIVE MATERIAL

Thomas J. Rockett, East Greenwich, R.I., and John J. O'Connell, Tustin, Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed June 3, 1974, Ser. No. 475,607

Int. Cl.² A61K *5/06*

U.S. Cl. 260—42.53 **5 Claims**

1. A dental composite consisting essentially of a polymerizable resin binder, a catalyst system for polymerizing said binder, and a finely-divided inorganic filler capable of being coupled to said binder, in which the improvement lies in said filler comprising a crystalline silicate containing barium as part of the crystalline composition thereof and selected from the group consisting of $Ca_2Ba(SiO_3)_3$, $BaAl_2Si_2O_8$, and $BaMgCa_2Si_2O_8$.

3,959,213

BASIC DYEABLE POLYESTER FIBER

Russell Gilkey, and Thomas H. Wicker, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 501,516, Aug. 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 468,313, May 9, 1974, abandoned. This application June 4, 1975, Ser. No. 583,950

Int. Cl.² C08G *63/12;* **C08L** *67/02;* **D06P** *3/52*

U.S. Cl. 260—45.7 P **3 Claims**

1. A basic dyeable textile fiber comprised of

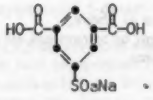
A. a polyetherester of

1. a dicarboxylic acid component comprising

a. from 82 to 94.5 mole percent terephthalic acid,

b. from 5 to 15 mole percent isophthalic acid, and

c. from 0.5 to 3 mole percent of a basic dyeable comonomer having the structural formula:



2. a diol component comprised of

a. 1,4-cyclohexanedimethanol, and

b. from 6 to 10 weight percent, based on the weight of the polyetherester, poly(oxyethylene)-glycol having an average molecular weight in the range of 400 to 4,000,

B. from 20–300 weight parts per million, based on the weight of the polyetherester, phosphorus derived from

1. phosphorous acid,

2. phosphoric acid,

3. pyrophosphoric acid,

4. polyphosphoric acid, or a compound corresponding to the formula

5.

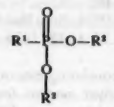
where

R^1 is —H, a monovalent alkyl radical having 1–18 carbon atoms, a monovalent aryl or substituted aryl radical having 6–15 carbon atoms, or —O—R where R is the same as R^1,

R^2 is —H, monovalent alkyl radical having 1–18 carbon atoms, or a monovalent aryl or substituted aryl radical having 6–15 carbon atoms, provided that when R^2 is alkyl, at least one of R^2 has a chain of at least

two unsubstituted methylene groups attached to the oxygen atoms attached to phosphorus,

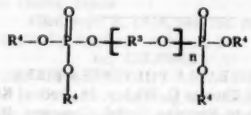
6.



where

R^1 and R^2 are the same as above,

7.

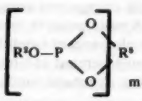


where

R^4 is —H, a monovalent alkyl radical having 1–18 carbon atoms, or a monovalent aryl or substituted aryl radical having 6–15 carbon atoms,

$n = 1–6$,

$R^3 = CH_{2x}$ where $x = 2–6$,



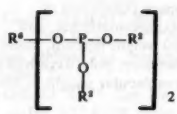
where

R^2 is the same as above,

R^5 is a divalent or tetravalent alkyl radical having 2–5 carbon atoms,

$m = 1$ or 2,

9.

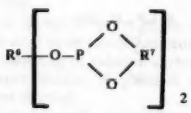


where

R^2 is the same as above,

R^6 is a divalent alkyl radical having 2–12 carbon atoms or a divalent aryl or substituted aryl radical having 6–15 carbon atoms,

10.

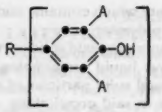


where

R^6 is the same as above,

R^7 is a divalent alkyl radical having 2–5 carbon atoms, and

C. based on the weight of the polyetherester, from 1000 to 5000 weight parts per million of a stabilizer effective to reduce oxidative degradation of the polyetherester corresponding to the structure



where

n is from 1 to 4,

R is a radical selected from the group consisting of

1. neopentanetetrayltetrakis [oxy(3-oxotrimethylene)],
2. phosphinylidynetrioxy,
3. 2,4,6-trimethyl-1,3,5-benzenetrlyltrimethylene,
4. alkylene having 1 to 5 carbon atoms,
5. alkyl having 1 to 12 carbon atoms,
6. 2,4,6-trioxo-1,2,3,4,5,6-hexahydro-s-triazine-1,3,5-triyl)tris(3-oxotrimethylene), and
7. [3-oxtadecyloxy)-3-oxopropyl], and

A is a monovalent radical selected from the group consisting of

1. tertiary alkyl having 4 to 8 carbon atoms,
2. alkyl having 8 to 22 carbon atoms, and

3,959,214

CYCLIC AMINE STABILIZERS

James Stewart Roberts, and Robert Lyle Craig, both of Stirling, Scotland, assignors to Imperial Chemical Industries Limited, London, England

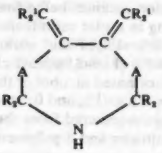
Filed Sept. 13, 1973, Ser. No. 396,664

Claims priority, application United Kingdom, Sept. 13, 1972, 42444/72

Int. Cl.² C08K *5/34, 5/35, 5/46;* **C08L** *23/02*

U.S. Cl. 260—45.8 N **10 Claims**

1. A polyolefin material stabilized against ultraviolet light in admixture with a stabilizing amount of a cyclic amine of the formula:



where

a. each group R may be the same or different group and is selected from the group consisting essentially of

i. unsubstituted hydrocarbon groups and

ii. substituted hydrocarbon groups containing a heteroatom selected from the group consisting of oxygen, sulphur, nitrogen and phosphorus atoms

and wherein two of said R groups attached to the same ring carbon atom may or may not be linked together to form a second ring

b. each group R′ may be the same or different group and is selected from the group consisting essentially of

i. hydrogen

ii. unsubstituted hydrocarbon groups and

iii. substituted hydrocarbon groups containing a heteroatom selected from the group consisting essentially of oxygen, sulphur, nitrogen and phosphorus atoms and wherein two of said R′ groups attached to the same ring carbon atom may or may be linked together to form a second ring and

c. each A may be the same or different entity and is selected from the class comprising

i. a direct link

ii. the group $—CH_2)_n$ where n is an integer

iii. the group —O—.

3,959,215

STABILIZATION OF LINEAR POLYESTERS

Ewald Schneider, Tamins, Switzerland, assignor to Inventa AG fur Forschung und Patentverwertung, Zurich, Switzerland

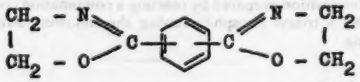
Filed Sept. 17, 1974, Ser. No. 506,784

Claims priority, application Switzerland, Sept. 24, 1973, 13660/73

Int. Cl.² C08K 5/35; C08L 67/02

U.S. Cl. 260—45.8 NZ 11 Claims

1. In a process for shaping a linear polyester comprising heating said polyester and forming said polyester into the desired shape, the improvement which comprises adding to said polyester at or before said forming a compound of the formula



wherein the hydrogen atoms may be substituted by one or more alkyl or aryl radicals.

3,959,216

N-(HALOBENZOYL) HEXAHALO-3,6-METHANOTETRAHYDROPHTHALIMIDES

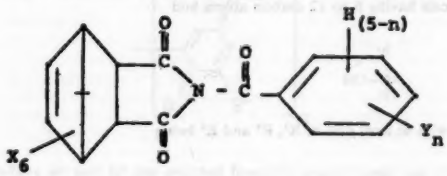
Sidney B. Richter, Chicago, and Glendon D. Kyker, Glen Ellyn, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Mar. 20, 1975, Ser. No. 560,654

Int. Cl.² C07D 209/48; C08K 3/20, 5/34

U.S. Cl. 260—45.75 B 13 Claims

1. A compound of the formula



wherein X and Y are each chlorine or bromine and *n* is an integer from 2 to 5.

7. A fire retardant polymeric composition comprising a combustible polymer and a fire retarding amount of a compound of claim 1.

3,959,217

N-(HALOBENZOYL)-4,5-DIBROMO-3,6-METHANOHEXAHYDROPHTHALIMIDES

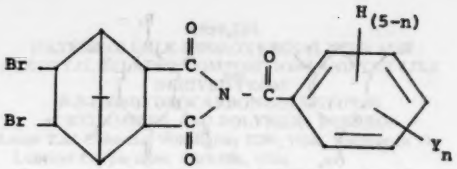
Sidney B. Richter, Chicago, and Glendon D. Kyker, Glen Ellyn, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Mar. 21, 1975, Ser. No. 560,452

Int. Cl.² C07D 209/48; C08K 3/20, 5/34

U.S. Cl. 260—45.75 B 11 Claims

1. A compound of the formula



wherein Y is chlorine or bromine and *n* is an integer from 2 to 5.

6. A fire retardant polymeric composition comprising a combustible polymer and a fire retarding amount of a compound of claim 1.

3,959,218

ULTRAVIOLET LIGHT STABILIZING SYSTEM

Ronald D. Mathis, Taylors, and James S. Dix, Greenville, both of S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 19, 1973, Ser. No. 324,975

Int. Cl.² C08J 3/20

U.S. Cl. 260—45.75 N 3 Claims

1. An ultraviolet light stabilized polymeric composition which comprises a normally solid polypropylene and a stabilizer system which consists of:

a. nickel bis(syn-methyl-2-hydroxy-4-methylphenylketoxime);

b. 2',4'-di-tert-butylphenyl-3,5-di-tert-butyl-4-hydroxybenzoate; and

c. octadecyl [3-(3,5-di-tert-butyl-4-hydroxyphenyl)]propionate; wherein said components (a), (b) and (c) are employed in amounts as follows: component (a), from 0.1 to 2 php, component (b), from 0.1 to 2 php and component (c), from 0.02 to 0.5 php; and wherein the weight ratio of (a) to (b) is in the range of 1:4 to 4:1 and the weight ratio of the combination of (a) and (b) to (c) is in the range of 25:1 to 5:1.

3,959,219

THERMOPLASTIC RESIN COMPOSITION HAVING REDUCED FLAMMABILITY

Toshikazu Aoyama, Nagoya; Yukinori Kimata, Gifu; Hotuma Okasaka, Nagoya; Hiroshi Kodama, Nagoya, and Naoya Yoda, Nagoya, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

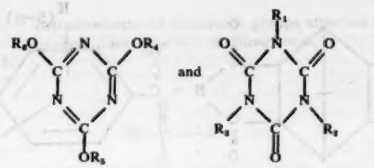
Filed Dec. 13, 1974, Ser. No. 532,524

Claims priority, application Japan, Dec. 27, 1973, 48-144230

Int. Cl.² C08J 3/20

U.S. Cl. 260—45.75 B 6 Claims

1. A thermoplastic resin composition having reduced flammability which comprises 100 parts by weight of a flammable thermoplastic polymer, 3 to 30 parts by weight of a flame retarding agent consisting of a halogenated aromatic compound and 0.3 to 20 parts by weight of an organic compound having acyanurate or isocyanurate ring structure, represented by the general formulas



wherein R_1, R_2, R_3, R_4, R_5 and R_6 are same or different radicals selected from the group consisting of hydrogen, -hydroxyethyl, -carboxyethyl, 2,3-dibromopropyl, phenyl, benzyl, tolyl, -acetoxyethyl, -benzoxyethyl, acetyl, tribromophenyl, propyl, butyl, 2,3-epoxypropyl, -phenoxyethyl and cresyl, and wherein the flammable thermoplastic polymer is selected from the group consisting of polycarbonate, polyester, polyamide and acrylonitrile-butadiene-styrene polymer.

6. The composition of claim 5 wherein the auxiliary flame-retarding agent is antimony oxide.

3,959,220
POLYMER ADDITIVES COMPRISING TRANSITION METAL COMPLEXES WITH TRIVALENT PHOSPHOROUS COMPOUNDS

Ingenuin Hechenbleikner, Park Ridge, N.J.; Thomas G. Kugele, Cincinnati, and John F. Hussar, Loveland, both of Ohio, assignors to Cincinnati Milacron Chemicals, Inc., Reading, Ohio

Division of Ser. No. 84,494, Oct. 27, 1970, Pat. No. 3,661,843. This application Dec. 16, 1971, Ser. No. 208,927
Int. Cl.² C08J 3/20
U.S. Cl. 260—45.75 N **14 Claims**

1. Organic solid polymer material normally susceptible to deterioration due to the effects of ultraviolet light containing a stabilizingly effective quantity of (A) a metal complex of a trivalent phosphorus compound, said complex having the formula

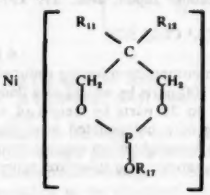
$$Me(L)_n(A)_m(L')_o$$

where Me is nickel, manganese, iron, molybdenum or tungsten, L is P(X)(Y)(Z) where any one or all of X, Y, and Z are O-hydrocarbyl,

where R_{31} and R_{32} are hydrocarbyl or hydrogen, O-hydrocarbyl

piperidyl, S hydrocarbyl, hydrocarbyl, halohydrocarbyl where the halogen has an atomic weight of 35 to 80, 2 or 3 of X, Y and Z together with P form a heterocyclic ring of 5 to 6 carbon atoms, A is an anion, m is zero or a small whole number, L' is CO, NO, CN or halogen, o is zero or a small whole number, n is a small whole number of at least 1, $o+m+n$ is not greater than the highest coordination number of the metal.

2. An organic material according to claim 1 wherein (A) is



where R_{11} and R_{12} are hydrogen or lower alkyl and R_{17} is hydrocarbyl or haloalkyl where the halogen has an atomic weight of 35 to 80.

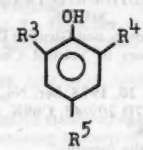
3,959,221
PHENOLIC PHOSPHITES AS STABILIZERS FOR POLYMERS

Farris H. Wilson, Jr., Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 10, 1973, Ser. No. 405,247
Int. Cl.² C08K 5/53
U.S. Cl. 260—45.95 D **13 Claims**

1. An oxidizable polymer containing an antioxidant amount of a composition prepared by reacting a combination comprising (A) a triaryl phosphite having the following structural formula

wherein R, R^1 and R^2 are selected from the group consisting of disubstituted, monosubstituted and unsubstituted aryl radicals having 6 to 20 carbon atoms, and (B) a hydroxy alkyl phenol having the following structural formula



wherein R^3, R^4 and R^5 are selected from the group consisting of hydrogen, alkyl radicals having 1 to 12 carbon atoms, cycloalkyl radicals having 5 to 12 carbon atoms, aralkyl radicals having 6 to 12 carbon atoms and

with at least one of R^3, R^4 and R^5 being

wherein R^6 is selected from the group consisting of hydrogen and alkyl radicals having 1 to 5 carbon atoms, wherein the molar ratio of the phosphite reactant to the phenolic reactant is from 1:1 to 1:9.

3,959,222
STABILIZED ACRYLATE RESINS

Harold E. De Le Mare, Houston, Tex., and Harry Frank, Cherry Hill, N.J., assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 28, 1975, Ser. No. 544,729
Int. Cl.² C08G 30/04
U.S. Cl. 260—47 EP **15 Claims**

1. A stabilized, curable acrylate resin composition having improved viscosity stability on storage and shipping which comprises a mixture of;

A. a liquid acrylate type resin made in the presence of free radical inhibitors or peroxide scavenger by the reaction of

acrylic acid, methacrylic acid or mixtures thereof with a liquid polyepoxide produced by contacting a polyphenol and epichlorohydrin, in the presence of a nucleophilic catalyst where at least 50% of the epoxide groups have reacted with said acrylic acid or methacrylic acid and the acrylate resin has greater than 0.015 equivalents of residual epoxide function per 100 grams resin,

B. an acid having a pKa of less than about 2.5 and having an anion with a nucleophilicity at 50°C in aqueous acetone of less than about 2.5 where said acid is present in an amount of from 1 to about 2 times the moles of nucleophilic catalyst used to make the acrylate resin, and

C. optionally, an additional inhibiting quantity of a free radical inhibitor and a peroxide scavenger.

3,959,223

OXIDATION-REDUCTION DIPHENOQUINONE-DIPHENOHYDROQUINONE POLYMERS

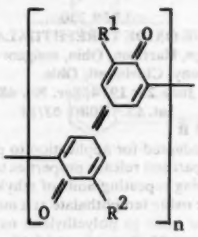
Allan S. Hay, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 21, 1974, Ser. No. 435,335

Int. Cl.² C08L 65/02

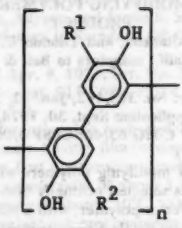
U.S. Cl. 260—47 R **12 Claims**

1. A homopolymer comprising recurring units of the formula:



where R^1 and R^2 are selected from the group consisting of monovalent acyclic and cyclic hydrocarbon radicals, and *n* is a positive integer of from about 10 to 15.

2. A homopolymer comprising recurring units of the formula:



where R^1 and R^2 are selected from the group consisting of acyclic and cyclic hydrocarbon radicals and *n* is a positive integer of from about 10 to about 15.

3,959,224

WATER-SOLUBLE HYDROXYALKYLATED AND ALKOXYALKYLATED COMPOSITIONS AND THE LIKE DERIVED FROM N-3-OXOHYDROCARBON-SUBSTITUTED ACRYLAMIDES, AND POLYMERS THEREOF

Lester Earl Coleman, Willoughby Hills, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

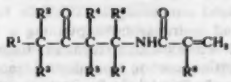
Continuation-in-part of Ser. No. 111,676, Feb. 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 833,162, June 13, 1969, abandoned, which is a continuation-in-part of Ser. No. 751,715, Aug. 12, 1968, abandoned. This application Dec. 16, 1974, Ser. No. 533,361

Int. Cl.² C08F 20/58, 20/70

U.S. Cl. 260—63 R **21 Claims**

1. A water-soluble composition consisting essentially of:

A. compounds of the formula



wherein each of R^1, R^2, R^3, R^4 and R^5 is hydrogen, a hydrocarbon or substituted hydrocarbon radical, a hydroxyalkyl radical having not more than 4 carbon atoms, or an alkoxy derivative of said hydroxyalkyl radical, at least one of R^1, R^2, R^3, R^4 and R^5 being a hydroxyalkyl radical or alkoxy derivative thereof; each of R^6 and R^7 is hydrogen or a hydrocarbon or substituted hydrocarbon radical; and R^8 is hydrogen, halogen or a lower alkyl radical; with the proviso that the substituents on said substituted radicals do not alter significantly the character or reactivity of said radicals; and

B. condensation dimers and trimers of said compounds.

8. An addition polymer of the composition of claim 1.

3,959,225

THERMALLY-STAGED POLYMER PROCESS

Irving Kuntz, Linden, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 452,969, March 20, 1974. This application Mar. 13, 1975, Ser. No. 558,125

Int. Cl.² C08F 2/02, 4/14, 210/00, 212/00

U.S. Cl. 260—63 R **9 Claims**

1. A process for the preporation of interpolymers from monomers comprising one or more polar monomers; one or more monoolefins having the general formula

wherein R_1 and R_2 are independently selected from the group consisting of halogen; hydrogen; straight and branched chain alkyl radicals; aryl; alkylaryl; aralkyl and cycloalkyl radicals having from 1 to 18 carbon atoms and halo substituted derivatives thereof; and optionally one or more acyclic or alicyclic conjugated or nonconjugated diolefins which comprises:

a. mixing a Lewis Acid and said polar monomer at a temperature in the range of −100°C to 0°C to form a Lewis Acid polar monomer complex;

b. mixing said complex with said olefin monomer and an active oxygen compound at said temperature to form a reaction mixture;

c. maintaining said reaction mixture at said temperature in a first stage for a time sufficient to convert at least 10 percent but not more than 50 percent of said polar monomer in said reaction mixture to said interpolymer;

d. thereafter raising the temperature of said reaction mixture to a higher temperature in the range of 0° to 100°C;

e. maintaining said reaction mixture at said higher temperature in a second stage for a time period of about 0.2 to 60

hours; and

f. recovering said interpolymer from said reaction mixture.

3,959,226

PRODUCTION OF SUBSTITUTED AROMATIC COMPOUNDS

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 4, 1974, Ser. No. 520,697

Int. Cl.² C07C 3/56

U.S. Cl. 260—671 R 9 Claims

1. A process for the reaction of an aromatic hydrocarbon with a compound containing an aldehyde functional group and a saturated hydrocarbon containing a tertiary carbon atom, or which is isomerized to form a saturated hydrocarbon containing a tertiary carbon atom during reaction conditions, in the presence of a Friedel-Crafts catalyst without extraneous hydrogen chloride, and recovering the resultant hydrocarbyl-substituted aromatic compound.

3,959,227

POLYFORMALS HAVING LOW METHYLOL END-GROUP CONTENT AND POLYURETHANES PRODUCED THEREFROM

Eugene Yue Chieh Chang, Somerville, and Tsi Tieh Li, Milltown, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 2, 1973, Ser. No. 356,553

Int. Cl.² C08G 2/18, 18/54

U.S. Cl. 260—67 TN 14 Claims

1. A polyformal having the formula:

$$V\left[R-O-CH_2-O\right]_xW$$

wherein R is the hydrocarbon portion of an α,ω-glycol, containing at least 4 carbon atoms in a single chain or a 4 carbon atom chain interrupted by a heteroatom which is oxygen or sulfur; wherein V is (a) $-OCH_2OH$ or (b) $-OCH_2ROH$ and W is (c) $-ROCH_2OH$ or (d) ROH, R being as defined, wherein the ratio of the total of (b) and (d) to the total of (a) and (c) is not less than 9:1; and x is an integer representing the degree of polymerization of a magnitude sufficient to produce a molecular weight of at least 500.

3,959,228

LOW CARBOXYL HIGH MOLECULAR WEIGHT POLYESTERS

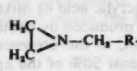
Freddie L. Massey, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 17, 1975, Ser. No. 558,867

Int. Cl.² C08G 63/46, 63/68

U.S. Cl. 260—75 T 10 Claims

1. Low carboxyl, high molecular weight polyester compositions comprising the product of a reaction of about 0.02 to about 1.00 percent by weight of the polyester of (1) an aziridine compound of the formula



where R is selected from the group consisting of straight and branched chain alkylene radicals containing from 0 to 10 carbon atoms and R' is selected from the group consisting of methyl, cycloalkyl and aryl radicals with (2) a molten polycondensation saturated polyester having an intrinsic viscosity of at least 0.4 as measured in a 60/40 phenol/tetrachloroethane mixed solvent at 30°C being derived from a reaction of (A) at least one diol of the formula $HO(CH_2)_nOH$ where n is an integer ranging from 2 to 10 and (B) at least one dicarboxylic acid or C_1 to C_4 alkyl ester thereof.

3,959,229

TEXTILE TREATMENTS

Anthony Peter Downing, and Richard Llewellyn Powell, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 6, 1974, Ser. No. 467,510

Claims priority, application United Kingdom, May 23, 1973, 24627/73

Int. Cl.² C08F 8/18; C08G 63/12

U.S. Cl. 260—75 H 26 Claims

1. An additive for imparting soil-release or anti-soiling characteristics to a textile comprising a copolymer formed by the chemical condensation of

A. an organic compound having a plurality of carboxylic anhydride groups, and

B. a bifunctional compound each functional group being condensible with the anhydride groups of (A) and also containing a terminal fluorocarbon group of at least three carbon atoms.

3,959,230

POLYETHYLENE OXIDE TEREPHTHALATE POLYMERS

Hugh Robert Hays, Harrison, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed June 25, 1974, Ser. No. 482,949

Int. Cl.² C08G 63/18

U.S. Cl. 260—75 R 4 Claims

1. A polymer adapted for application to polyester-containing fabrics to impart soil release properties to said fabrics, the polymer comprising repeating units of ethylene terephthalate and polyethylene oxide terephthalate at a molar ratio of ethylene terephthalate units to polyethylene oxide terephthalate units of from about 25:75 to about 35:65, said polyethylene oxide terephthalate containing polyethylene oxide having a molecular weight of from about 300 to 700, the molecular weight of said soil release polymer being in the range of from about 25,000 to about 55,000 and the melting point of said polymer being below 100°C.

3,959,231

METHOD OF MODIFYING POLYMERS AND NOVEL PRODUCT

John H. Rolker, Altadena, and Thomas C. Glasner, Los Angeles, both of Calif., assignors to Bell & Howell Company, Pasadena, Calif.

Division of Ser. No. 325,492, Jan. 22, 1973, Pat. No. 3,864,320. This application Sept. 30, 1974, Ser. No. 510,331

Int. Cl.² C08G 63/46; C08F 6/00, 20/10

U.S. Cl. 260—75 T 7 Claims

1. A method of modifying polymers which method comprises contacting a selected normally non-reactive saturated condensation polyester polymer, with a selected catalyst in a contacting zone, said catalyst comprising a metal carbonyl of a group VIII transition element, said contacting being effected for a time sufficient to change the characteristics of said polymer, and recovering the resulting modified polymer from said contacting zone as a new product.

3,959,232

POLYAMIDE FROM HEXAHYDROBENZODIPYRROLE

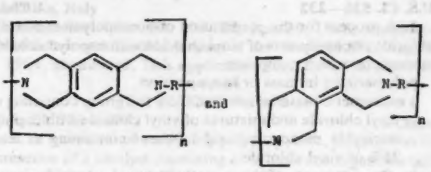
John T. Stapler, Northboro, and Joseph Bornstein, Needham Heights, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 373,828, June 26, 1973, abandoned. This application Nov. 8, 1974, Ser. No. 522,163

Int. Cl.² C08G 69/26

U.S. Cl. 260—78 R 6 Claims

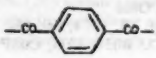
1. A film and fiber formed polymer selected from the class of polyamides consisting essentially of repeating units having the following structural formulae:

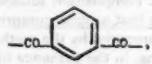


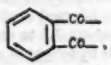
wherein R is selected from the group consisting of:

$-CO-(CH_2)_4-CO-$,

$-CO-(CH_2)_8-CO-$,







n is 25 to 5000.

3,959,233

PROCESS FOR PREPARING POLYAMIDE-IMIDE FROM TRIMELLITIC ACID, DIAMINE AND DIISOCYANATE AND POLYAMIDE IMIDE SHAPED ARTICLES

Robert B. Hanson, Aurora, and James R. Stephens, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 9, 1973, Ser. No. 348,869

Int. Cl.² C08G 73/14

U.S. Cl. 260—77.5 R 12 Claims

1. A process for preparing high molecular weight polyamide-imide polymers having film-forming properties which process comprises first condensing trimellitic acid and a primary diamine in a mole ratio of about 1 to 0.7 to about 1 to 0.95 at a temperature of about 210°C. to about 250°C. to give a low molecular weight polymer having an excess of trimellitic anhydride moieties and then further condensing this polymer with about 0.05 to about 0.75 moles of a diisocyanate for each mole of trimellitic acid moiety in an inert solvent at a temperature of about 25°C. to about 150°C.

3,959,234

METHOD OF POLYMERIZING CARBONIMIDE NORBORNENE DERIVATIVES

Shigeru Kurosawa; Takashi Ueshima, and Shoichi Kobayashi, all of Yokohama, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1974, Ser. No. 520,096

Claims priority, application Japan, Nov. 5, 1973, 48-123329

Int. Cl.² C08G 69/00

U.S. Cl. 260—78 UA 49 Claims

1. A method of polymerizing carbonimide norbornene derivatives to resinous or rubbery materials which comprises the ring-opening polymerization of carbonimide norbornene derivatives having at least one N-substituted cyclic carbonimide group in the presence of a catalytic system consisting of organic aluminum compounds and at least one compound comprising a metal selected from the group consisting of tungsten and molybdenum.

3,959,235

METHOD OF POLYMERIZING VINYL CHLORIDE

Masahiko Nishigaki, Nishinomiya; Masami Ohnishi; Yosuke Ichikawa, both of Kobe, and Kazuhiko Katayama, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed July 17, 1975, Ser. No. 596,855

Claims priority, application Japan, July 24, 1974, 49-85849

Int. Cl.² C08F 2/18, 2/22

U.S. Cl. 526—62 15 Claims

1. In a method of polymerizing a monomer comprising vinyl chloride in an aqueous reaction medium, the improvement which comprises coating prior to polymerization the surfaces of the polymerization vessel and auxilliary equipment with at least one compound selected from the group consisting of 3,3′-di-indolyl, 2,2′-di-indolyl, 2,3′-di-indolyl and 3,3′-di-indoleninylidene.

3,959,236

POLYMERS AND COPOLYMERS OF HYDROXYALKYL METHACRYLATE SULFO ESTERS AND THE METHOD FOR THEIR MANUFACTURING

Jan Peška; Milan Beneš, and Jiří Štamberg, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

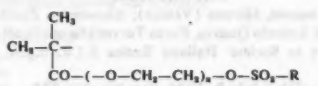
Filed Aug. 8, 1974, Ser. No. 495,641

Claims priority, application Czechoslovakia, Aug. 15, 1973, 5754-73

Int. Cl.² C08F 28/02; C08G 75/24

U.S. Cl. 260—79.3 M 11 Claims

1. A chemically reactive polymer of polymerized hydroxyalkylmethacrylate sulfo esters characterized by monomer units of the formula



wherein *n* is an integer equal to 1 or 2 and R is selected from the group consisting of C_6H_5—, p—$CH_3C_6H_4$— and CH_3—.

3,959,237

SUSTAINED RELEASE POLYMERS

Izhak Blank, Haifa, Israel, assignor to Hydrophilics International, Inc., New York, N.Y.

Filed Aug. 11, 1972, Ser. No. 279,888

Claims priority, application United Kingdom, Aug. 12, 1971, 37936/71

Int. Cl.³ C08F 220/06

U.S. Cl. 526—16 8 Claims

1. A water soluble copolymer consisting essentially of from 20 to 60 parts of at least one member selected from the class

consisting of acrylic acid and methacrylic acid, from 20 to 70 parts of at least one member selected from the class consisting of lower alkyl acrylates and lower alkyl methacrylates, and from 5 to 20 parts of a long chain ester of acrylic or methacrylic acid, said chain having from 8 to 18 carbon atoms, said copolymer having a molecular weight of more than one million as determined by its intrinsic viscosity in methylethyl ketone at 25°C, in which at least 25% of the acid groups have been neutralized by multi-valent cations.

3,959,238
TERPOLYMERS OF STYRENE, ISOBUTYLENE AND BETA-PINENE

Takeo Hokama, Chicago, Ill., and Frank Scardiglia, Woodcliff Lake, N.J., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Apr. 14, 1975, Ser. No. 567,563
Int. Cl.² C08F *210/00*, *212/00*
U.S. Cl. 526—281 **3 Claims**

1. A solid homogeneous and essentially random terpolymer of styrene, isobutylene and beta-pinene having a number average molecular weight of from about 1500 to about 7000, a styrene content of from about 40 to about 60 weight percent, an isobutylene content of from about 10 to about 40 weight percent, a beta-pinene content of from about 10 to about 40 weight percent and a ring and ball softening point of from about 160°F to about 240°F.

3,959,239
USE OF NICKEL CYCLOOCTADIENE AS A HYDROGENATION CATALYST

Stephen A. Butter, East Windsor, and James G. Murray, East Brunswick, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 5, 1975, Ser. No. 574,480
Int. Cl.² C08C *19/02*
U.S. Cl. 526—25 **8 Claims**

1. A process for hydrogenating hydrocarbon materials having olefinic unsaturation and/or olefinic-aromatic unsaturation whereby olefinic bonds are reduced and when components of the reaction mixture contain aromatic unsaturation selective hydrogenation of olefinic bonds is effected without substantial, if any, hydrogenation of aromatic unsaturation; said process comprising contacting such hydrocarbon materials under hydrogenation reaction conditions of temperature and pressure in the presence of bis (1,5-cyclooctadiene) nickel as hydrogenation catalyst.

3,959,240
CATALYTIC PROCESS FOR THE PREPARATION OF POLYACRYLONITRILE AND ACRYLONITRILE COPOLYMERS

Luciano Console, Mirano (Venice); Alessandro Zecchin, Sassari, and Antonio Quarta, Porto Torres (Sassari), all of Italy, assignors to Societe' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed July 8, 1974, Ser. No. 486,722
Claims priority, application Italy, July 6, 1973, 26268/73
Int. Cl.² C08F *120/44*, *220/44*
U.S. Cl. 526—341 **10 Claims**

1. The method of polymerizing a monomer composition containing at least 85% by weight of acrylonitrile and up to 15 % by weight of a further ethylenically unsaturated monomer copolymerizable therewith, which comprises contacting the monomer composition in an aqueous medium at a temperature from 40° to 55°C., with a catalytic system comprising a water soluble persulphate, a water-soluble hydroxylamine mono-or disulphonic acid salt and a watersoluble ferrous salt wherein the molar ratio of said persulphate to said ferrous salt is from 10^2:1 to 10^5:1, the molar ratio of said persulphate to said hydroxylamine sulphonic acid salt is from 0.1:1 to 10:1 and the said catalytic system in a proportion of from 0.05 to 10 parts by weight to 100 parts by weight of said monomer composition.

3,959,241
VINYL CHLORIDE POLYMERS AND COPOLYMERS

Hans Jaspers, Diepenreen, Netherlands, assignor to Koninklijke Industrieele Maatschappij Noury & van der Lande N.V., Deventer, Netherlands

Filed Sept. 15, 1971, Ser. No. 180,716
Claims priority, application Netherlands, Sept. 25, 1970, 7014141
Int. Cl.² C08F *14/06*
U.S. Cl. 526—232 **1 Claim**

1. A process for the preparation of homopolymers of vinyl chloride or copolymers of vinyl chloride with copolymerizable monomers, which comprises

polymerizing in mass or in suspension

a monomeric material selected from the group consisting of vinyl chloride and mixtures of vinyl chloride with copolymerizable monomers, said mixtures containing at least 25% of vinyl chloride

in the presence of bis-o-methylbenzoyl peroxide in an amount sufficient for initiating the polymerizing reaction.

3,959,242
SILANE GRAFTED POLY(VINYL ALCOHOL) FILM

William A. Watts, Akron, and Warren K. Pierce, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 12, 1974, Ser. No. 496,593
Int. Cl.² B05D *3/06*; C08F *8/42*
U.S. Cl. 526—9 **14 Claims**

1. A thermoplastic composition suitable as a mold release surface for preparing cast articles comprising a silane grafted poly(vinyl alcohol) prepared by the method which comprises incrementally reacting, in the presence of an organic solvent for the silane and essentially a non-solvent for said poly(vinyl alcohol) and the required thermoplastic composition product and at a temperature selected in the general range of about 0°C to about 100°C, about 2.5 to about 25 parts by weight of a silane with 100 parts by weight of poly(vinyl alcohol), where said poly(vinyl alcohol) is characterized by having a molecular weight in the range of about 5,000 to about 150,000, by having a 4 weight percent aqueous solution viscosity at 20°C in the range of about 5 to about 65 centipoises, and by containing about 70 to about 98 weight percent vinyl alcohol units, about 30 to about 2 weight percent vinyl acetate units, and correspondingly, about 0 to about 15 weight percent units of functional hydrocarbon radicals having the formula

where Y is selected from hydrogen, and functional groups selected from $-NO_2$, $-SO_3H$, $-COOH$, $-CHO$, $-OH$, $-NH_2$ and $-SH$ groups and where said silane is represented by the formula

where *a* and *b* are each integers selected from 0, 1, 2, 3 and 4 with the sum of *a* and *b* being 4, where R is a saturated alkyl radical having 1 to 6 carbon atoms, and where X is selected from hydrogen, hydroxyl, esters of the formula $-CO_2R$, alkoxy radicals of the formula $-OR$, primary and secondary amines of the formula $-RNH_2$ and $-RNH$, ether amines of the formula $-R'OHN_2$, isocyanates of the formula $-R'NCO$, primary nitrile radicals of the formula $-R'C \equiv N$, primary sulfanyl radicals of the formula $-R'SH$, and monoepoxide radicals selected from epoxy alkyl, epoxy oxy alkyl, epoxy alicyclic alkyl, and epoxy alicyclic radicals, where R' is selected from saturated alkyl radicals having 1 to 6 carbon

atoms and cycloalkyl, aryl and alkaryl radicals containing 6 to 10 carbon atoms.

3,959,243

METHOD FOR PREPARING ALPHA-OLEFIN POLYMERS

Franco Mattioli, Terni, Italy, and Oliviero Guanciale, deceased, late of Terni, Italy (by Eufrasia Fortunata Di Scenna Guanciale, heir), assignors to Montecatini Edison S.p.A., Milan, Italy

Continuation of Ser. No. 701,555, Jan. 30, 1968, abandoned, which is a continuation-in-part of Ser. No. 393,812, Aug. 8, 1964, abandoned. This application Jan. 21, 1970, Ser. No. 4,464

Int. Cl.² C08F *6/00, 6/28*

U.S. Cl. 526—494 **4 Claims**

1. In a method of stabilizing polypropylene, prepared in the presence of a catalyst consisting of at least one organometallic compound of a metal belonging to Groups, I, II or III of the Periodic Table and a solid crystalline halide of a transition metal belonging to Groups IV, V or VI of the Periodic Table, against thermal oxidation and ageing by removing residue of said catalyst from said polypropylene, the improvement which comprises effecting said removal by dispersing in an aqueous slurry of said polypropylene a surfactant selected from the group consisting of polyoxyethylene (20) sorbitan monolaurate, polyoxyethylene (20) sorbitan monopalmitate and polyoxyethylene (20) sorbitan monooleate and thereafter separating the polypropylene from said slurry.

3,959,244

HYDROXY-TERMINATED POLYMERS OF BUTADIENE

Norman G. Gaylord, New Providence, N.J., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Aug. 27, 1973, Ser. No. 392,136

Int. Cl.² C08F *136/06, 8/00*

U.S. Cl. 526—84 **9 Claims**

1. A process for preparing a hydroxy-terminated polymer of butadiene having about two terminal hydroxy groups per molecule comprising subjecting butadiene to polymerization conditions in a chain transfer solvent at a temperature of from about 50° to about 170°C. with t-butyl beta-hydroxyethyl peroxide as an initiator.

3,959,245

L-ASPARTYL-AMINOMALONIC ACID METHYL 2-METHYLCYCLOHEXYL DIESTER

Nobuo Nakajima, Nishinomiya; Hisashi Aoki, Sulta; Masahiko Fujino, Takarazuka; Osamu Nishimura, Toyonaka; Mitsuhiro Wakimasu, Suita, and Mitsuhiko Mano, Settsu, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 27, 1973, Ser. No. 345,328

Claims priority, application Japan, Mar. 29, 1972, 47-31485; Mar. 30, 1972, 47-32007

Int. Cl.² A23L *1/22;* **C07C** *103/52*

U.S. Cl. 260—112.5 R **1 Claim**

1. L-aspartyl-aminomalonic acid methyl 2-methylcyclohexyl diester and its physiologically acceptable salts.

3,959,246

PREPARATION OF SOLUBLE EDIBLE PROTEIN FROM LEAFY GREEN CROPS

Emanuel M. Bickoff, Oakland; Donald de Fremery, Orinda; Richard H. Edwards, Albany; Benny E. Knuckles, San Pablo; George O. Kohler, El Cerrito, and Raymond E. Miller, Richmond, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed July 8, 1974, Ser. No. 486,703

Int. Cl.² A23J *1/14*

U.S. Cl. 260—112 R **4 Claims**

1. A process for isolating soluble, odorless, bland protein, which comprises —

a. pressing green leafy vegetable material to separate the juice therefrom,

b. heating the juice to a temperature of about 55°–70° C. in a period of about 0.6 second or less, holding the juice at said temperature for a period of 0 to 40 seconds, and rapidly cooling it to a temperature of about 40°–45° C., whereby to form an agglomerate containing chloroplastic proteins, chlorophyll, carotenoids, and lipids while retaining cytoplasmic proteins in solution in the juice,

c. separating said agglomerate from the residual juice,

d. cooling the said residual juice to a temperature of 0° to 5° C. and acidifying it to a pH of 3.5 to 5.5, whereby to precipitate the protein therein,

e. separating the precipitated protein from the residual juice, and

f. neutralizing the separated protein to a pH of 7.

3,959,247

TRH TARTRATE CRYSTALS

Masahiko Fujino, Takarazuka, and Chitoshi Hatanaka, Kyoto, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed June 21, 1974, Ser. No. 481,909

Claims priority, application Japan, July 2, 1973, 48-74973

Int. Cl.² C07C *103/52;* **C07G** *7/00*

U.S. Cl. 260—112.5 TR **6 Claims**

1. L-pyroglutamyl-L-histidyl-L-proline amide tartrate.

3,959,248

ANALOGS OF THYROTROPIN-RELEASING HORMONE

Daniel F. Veber, Ambler; Frederick W. Holly, Glenside; Ruth F. Nutt, Green Lane, and Sandor L. Varga, Harleysville, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 457,689, April 3, 1974, abandoned. This application Jan. 27, 1975, Ser. No. 543,734

Int. Cl.² C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 TR **53 Claims**

1. Tripeptide having the formula

$$M_1—M_2—M_3—E$$

wherein

a. M_1 is selected from the group consisting of 2-ketoimidazolidine-5-carboxylic acid, 2-ketopiperidine-6-carboxylic acid, and pyroglutamic acid,

b. M_2 is selected from the group consisting of histidine and N^{im}-substituted-histidine wherein the substituent is C_1–C_8 lower alkyl or $—(CH_2)_bCOOH$, where b is an integer from 1–4,

c. M_3 is selected from the group consisting of L-2-piperidinecarboxylic acid, L-proline and L-thiazolidine-5-carboxylic acid, and

d. E is selected from the group consisting of $—NH_2$ and -OR wherein R is C_1–C_{10} alkyl, such that (i) when E is $—NH_2$, pyroglutamic acid and L-proline do not occur together in said tripeptide, and (ii) when E is —OR , histidine and L-proline do not occur together in said tripeptide.

3,959,249

METHOD FOR ISOLATING TRANSFERRINES FROM BIOLOGICAL MATERIALS

Eraldo Antonini, Rome, Italy, assignor to Officina Terapeutica Italiana O.T.I. Laboratorio Biologico S.p.A., Parma, Italy

Filed Oct. 24, 1974, Ser. No. 517,742
Claims priority, application Italy, Oct. 31, 1973, 30771/73
Int. Cl.² A23J *1/06*; C07G *7/00*, *7/04*
U.S. Cl. 260—122 11 Claims

1. A method for isolating transferrines at a pure state from biological materials containing transferrines, wherein the biological material is brought to pH between 3 and 6 and caused to pass through a mass of material comprising a solid carrier containing chelating groups coordinated to metal ions of the transition group, in the presence of a buffer solution at pH between 3 and 6 free of chelating properties, wherein such a mass is then caused to be passed through by a solution containing a component showing affinity for the transferrine-metal complex, and wherein from said solution which has passed through the mass the pure transferrine is separated by removal of those components having a molecular weight lower than that of the transferrine.

3,959,250

BISAZO DYESTUFFS OF THE 2,6-DIAMINOPYRIDINE

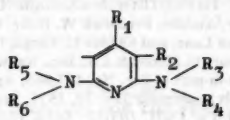
Ernst Heinrich; Konrad Mix, both of Frankfurt am Main, and Joachim Ribka, Offenbach (Main) - Burgel, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

Filed Feb. 1, 1974, Ser. No. 438,616
Claims priority, application Germany, Feb. 10, 1973, 2306673
Int. Cl.² C09B *31/14*
U.S. Cl. 260—156 13 Claims

1. A bisazo dyestuff of the formula

$$Q - N=N - A - N=N - Q_1$$

wherein each of Q and Q_1 is a radical of the formula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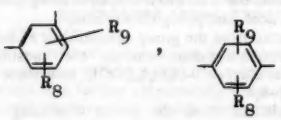
A is a radical of the formulae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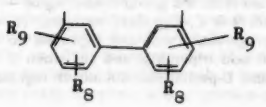
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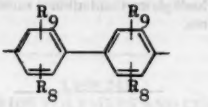
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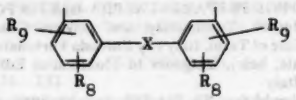
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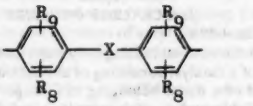
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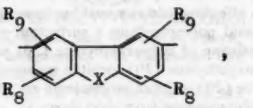
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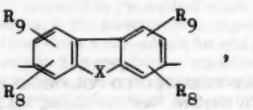
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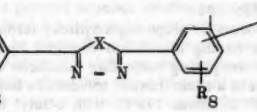
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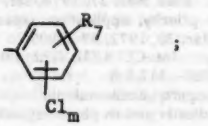
;

R_1 is alkyl having 1 to 3 carbon atoms; R_2 is cyano or —$CONH_2$; each of R_3 and R_5 is hydrogen, methyl, —C_2H_4OH, —$CH_2CH(OH)CH_3$, —$CH_2CH_2CH_2OH$, —$C_2H_4CONH_2$, benzyl, phenethyl, cyclopentyl, cyclohexyl or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each of R_4 and R_6 is hydrogen, alkyl having 1 to 3 carbon atoms, $-C_2H_4OH$, $-CH_2CH(OH)CH_3$ $-C_2H_4CN$ or $-CH_2CH_2CH_2OH$; R_7 is hydrogen, methyl, methoxy, $-NHCOCH_3$ or $-NHCOC_6H_5$; m is 0, 1, 2 or 3; each of R_8 and R_9 is hydrogen, halogen, nitro, methyl or methoxy; X is —O—, —S—,

or $-SO_2-$ and X_1 is —O—, —S— or —NH—.

3,959,251

STABILIZED AGAR PRODUCT AND METHOD FOR ITS STABILIZATION

Jerker Olof Porath, and Jan-Christer Janson, both of Uppsala, Sweden, assignors to Exploaterings Aktiebolaget T.B.F., Uppsala, Sweden

Continuation of Ser. No. 155,816, June 23, 1971. This application June 10, 1974, Ser. No. 477,746

Claims priority, application Sweden, June 25, 1970, 8819/70; June 3, 1971, 7180/71; June 10, 1971, 7549/71

Int. Cl.² C07H *15/08*

U.S. Cl. 260—209 R **3 Claims**

1. In a method of preparing spherical beads of cross-linked agar product, comprising forming spherical water-swollen beads of a member selected from the group consisting of agar and agarose, and then cross-linking said member with a member selected from the group consisting of bisepoxide, epihalohydrin and divinyl sulfone in an alkaline aqueous slurry of said beads; the improvement in which said cross-linking is conducted in an oxygen-free environment, and contacting said beads with a reducing agent during said cross-linking.

3,959,252

ALKAMOYL-JOSAMYCINS

Takashi Osono; Kiruko Moriyama; Keisuke Murakami, and Hamao Umezawa, all of Tokyo, Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Japan

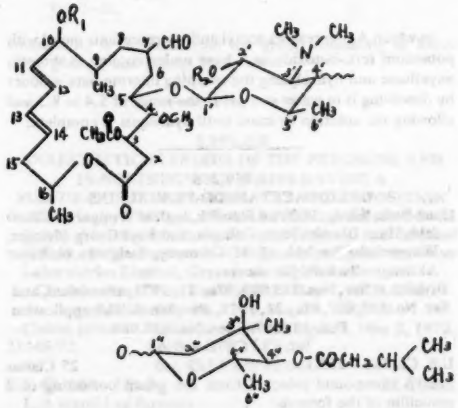
Continuation-in-part of Ser. No. 811,346, March 28, 1969, abandoned. This application Aug. 21, 1972, Ser. No. 282,013

Claims priority, application Japan, Mar. 29, 1968, 43-20381; Mar. 29, 1968, 43-20382

Int. Cl. C07c *129/18*

U.S. Cl. 260—210 AB **12 Claims**

1. Lower alkanoyl-josamycins having the formula



wherein R_1 and R_2 each represents hydrogen or a lower alkanoyl, with the proviso that R_1 and R_2 cannot be hydrogen at the same time.

3,959,253

β-D-GLUCOSYLURONIC ACID DERIVATIVES

Howard Jones, Holmdel, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed July 2, 1973, Ser. No. 376,014

Int. Cl.² C07C *13/04*

U.S. Cl. 260—210 R **6 Claims**

1. A process for preparing 1-O-β-D-glucopyranosyluronic acid ester of:

a. 5-fluoro-2-methy-1-(p-methylsulfinylbenzylidene) indenyl-3-acetic acid;
b. 5-fluoro-2-methyl-1-(p-methylsulfonylbenzylidene) indenyl-3-acetic acid;
c. 5-methoxy-2-methyl-1-(p-chlorobenzylidene)-indenyl-3-acetic acid;
d. 4-amino-2-hydroxybenzoic acid;
e. 2-hydroxybenzoic acid;
f. p-(dipropylsulfamoyl) benzoic acid;
g. [2,3-dichloro-4-(2-methylenebutynyl)phenoxy]-acetic acid;
h. pyridine-3-carboxylic acid; or
i. trans-4-(aminomethyl) cyclohexanecarboxylic acid;

which comprises hydrolyzing the corresponding 2,3,4-tri-O-acetyl-1-O-βD-glucopyranosyluronate esters in a polar solvent in the presence of an acid, wherein the mole ratio of acid to ester starting material is about 4 to 15, and the normality of the total reaction mixture is between 0.5 and 1.5.

3,959,254

ANTIBIOTIC G-418 AND THE PRODUCTION THEREOF

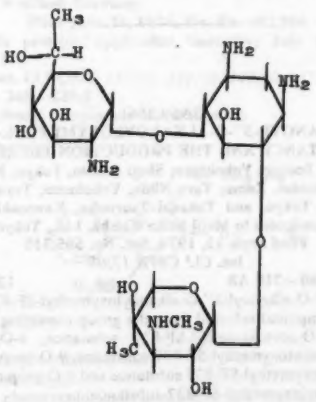
Marvin J. Weinstein; Gerald H. Wagman, both of East Brunswick; Raymond T. Testa, Verona, and Joseph A. Marquez, Montclair, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 196,707, Nov. 8, 1971, abandoned. This application Nov. 8, 1973, Ser. No. 414,010

Int. Cl.² C07H *15/22*

U.S. Cl. 260—210 AB **5 Claims**

1. A compound selected from the group consisting of Antibiotic G-418 having the formula:



and the pharmaceutically acceptable acid addition salts thereof.

3,959,255

ANTIBIOTIC AMINOGLYCOSIDES, AND PROCESS OF PREPARATION

Jean-Bernard Chazan, Paris; Daniel Coussediere, Villejuif, and Jean-Claude Gasc, Bondy, all of France, assignors to Roussel-UCLAF, Paris, France

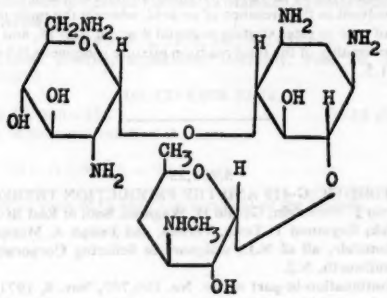
Filed Apr. 29, 1974, Ser. No. 464,934

Claims priority, application France, May 10, 1973, 73.16882; Mar. 5, 1974, 74.07410

Int. Cl.[2] C07H *15/22*

U.S. Cl. 260—210 AB 5 Claims

1. The 4-O-[2′,6′-diamino 2′,6′-didesoxy α,D-glucopyranosyl] 6-O-[3′′-methylamino 3′′,4′′,6′′-tridesoxy α,D-xylohexopyranosyl] 2-desoxy streptamine of the formula:



and its pharmaceutically acceptable salts.

3,959,256

9-O-ALKANOYL-3′′-O-ALKANOYLOXYMETHYL-SF-837 SUBSTANCE AND THE PRODUCTION THEREOF

Shigeharu Inouye, Yokohama; Shoji Omoto, Tokyo; Katsuyoshi Iwamatsu, Zama; Taro Niida, Yokohama; Toyoaki Kawasaki, Tokyo, and Takashi Tsuruoka, Kawasaki, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Sept. 12, 1974, Ser. No. 505,310

Int. Cl.[2] C07H *17/08*

U.S. Cl. 260—210 AB 12 Claims

1. A 9-O-alkanoyl-3′′-O-alkanoyloxymethyl-SF-837 substance compound selected from the group consisting of 9-O-acetyl-3′′-O-acetoxymethyl-SF-837 substance, 9-O-propionyl-3′′-O-acetoxymethyl-SF-837 substance, 9-O-acetyl-3′′-O-propionyloxymethyl-SF-837 substance and 9-O-propionyl-3′′-O-propionyloxymethyl-SF-837 substance.

3,959,257

PRODUCTION OF COFORMYCIN AND INTERMEDIATES THEREFOR

Hamao Umezawa; Kenji Maeda, both of Tokyo, and Shinichi Kondo, Yokohama, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Japan

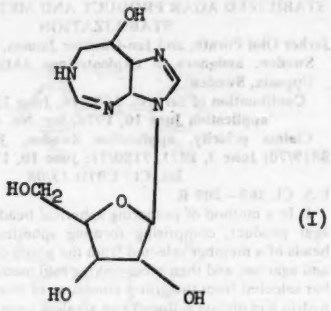
Filed Oct. 24, 1974, Ser. No. 518,030

Claims priority, application Japan, Nov. 14, 1973, 48-127174

Int. Cl.[2] C07H *19/18*

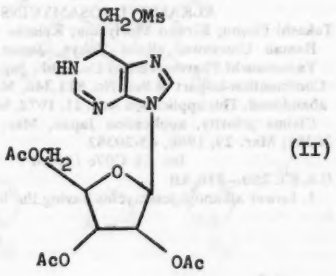
U.S. Cl. 260—211.5 R 4 Claims

1. A process for the preparation of coformycin of the formula (I):



(I)

which comprises treating 9-(2,3,4-tri-O-acetyl-β-D-ribofuranosyl)-6-mesyloxymethyl-1,6-dihydropurine of the formula (II)



(II)

in which Ac represents acetyl and Ms represents mesyl with potassium tert.-butoxide as a base under cooling in dimethoxyethane and hydrolyzing the resulting intermediate product by dissolving it in water at a pH in the range of 5.4 to 8.5 and allowing the solution to stand until hydrolysis is complete.

3,959,258

UREIDOACETAMIDO-PENICILLINS

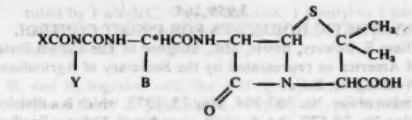
Hans-Bodo König; Wilfried Schrück, both of Wuppertal-Elberfeld; Hans Disselnkötter, Cologne, and Karl Georg Metzger, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. Nos. 145,809, May 21, 1971, abandoned, and Ser. No. 145,877, May 21, 1971, abandoned. This application Dec. 19, 1973, Ser. No. 425,966

Int. Cl.[2] C07D *449/68*

U.S. Cl. 260—239.1 27 Claims

1. A compound selected from the group consisting of a penicillin of the formula:



and the pharmaceutically acceptable salts thereof,
wherein the carbon atom designated * constitutes a center of chirality;
X is hydrogen, lower alkyl, monohalo(lower alkyl), dihalo(lower alkyl), trihalo(lower alkyl), lower alkoxy or cyclohexyloxy;
Y is lower alkyl; and
B is phenyl or phenyl substituted by lower alkyl, lower alkoxy, monohalo dihalo or lower alkylthio.

3,959,259

1,2,4-OXADIAZOLONYLACETYL PENICILLINS

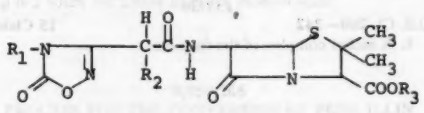
Hermann Breuer, Regensburg, Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 486,542, July 8, 1974, Pat. No. 3,929,782, which is a continuation-in-part of Ser. No. 450,929, March 13, 1974, abandoned. This application Oct. 9, 1975, Ser. No. 621,174

Int. Cl.² C07D *499/76*

U.S. Cl. 260—239.1 **4 Claims**

1. A compound of the formula:



wherein R_1 is selected from the group consisting of hydrogen, lower alkyl and phenyl-lower alkyl; R_2 is selected from the group consisting of hydrogen, lower alkyl, phenyl, hydroxyphenyl, thienyl, furyl, and pyridyl; and R_3 is selected from the group consisting of hydrogen, lower alkyl, phenyl-lower alkyl, benzhydryl, trimethylsilyl, a salt forming ion selected from the group consisting of aluminum, alkali metal, alkaline earth metal, lower alkylamine, phenyl-lower alkylamine and N-lower alkylpiperidine, and $-CH_3-$

wherein R_4 is selected from the group consisting of lower alkyl, phenyl, and phenyl-lower alkyl.

3,959,260

ANAESTHETIC STEROIDS OF THE PREGNANE AND 19-NORPREGNANE SERIES HAVING A SULFUR-CONTAINING GROUP AT THE 21-POSITION

Gordon Hanley Phillipps, Wembley; Robin Lawrence, Stoke Poges; Christopher Earle Newall, London, and Michael Wright, Stoke Poges, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

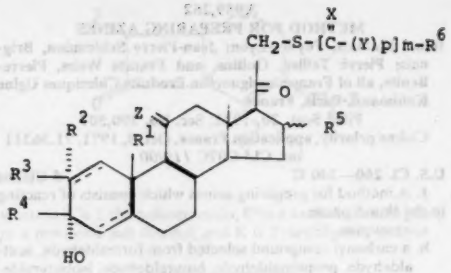
Continuation of Ser. No. 356,097, May 1, 1973. This application July 16, 1974, Ser. No. 488,989

Claims priority, application United Kingdom, May 5, 1972, 21145/72

Int. Cl.² C07J *43/00*

U.S. Cl. 260—239.5 **22 Claims**

1. A steroid of formula



wherein
R^1 is a hydrogen or methyl;
R^2 is hydrogen or methyl;
R^3 is hydrogen or when R^2 is hydrogen, C_1—$_6$ alkoxy, C_1—$_6$ alkanoyloxy, C_1—$_5$ alkyl, thiocyanato or halo;
R^4 is hydrogen or methyl;
R^5 is hydrogen, methyl in either the α or β-configuration or a gem-dimethyl group;
Z represents two hydrogen atoms or an oxo group;
Each of X and Y is a sulphur or oxygen;
Each of m and p is 0 to 1;
R^6 is C_1—$_6$ alkyl, C_1—$_6$ alkyl substituted by halogen or a 5 or 6-membered N-attached, heterocyclic group which may contain a further heteronitrogen, oxygen or sulphur atom, or a C_1—$_6$ dialkylamino group; cyclohexyl; phenyl, phenyl substituted by a C_1—$_6$ alkyl, C_1—$_6$ alkylthio, alkoxycarbonyl the alkyl portion of which contains 1-6 carbon atoms or a nitro group or a halogen atom; benzyl; pyridyl or when m=1 and p=0 an N-attached, 5 or 6 membered, heterocyclic group which may contain a further nitrogen, oxygen or sulphur atom, or when m=0 a cyano group or hydrogen; there being a 5α -hydrogen atom when a 21-acetylthio group is present in a saturated or otherwise unsubstituted 3α -hydroxy-pregnane-11, 20-dione or, where the steriod carries a basic group, a physiologically acceptable acid addition salt thereof; the dotted lines representing a double bond at either one of these positions.

3,959,261

BIPHENYL COMPOUNDS

Ansgar Lerch, Kirrlach; Alfred Popelak, Rimbach; Kurt Stach, Mannheim; Klaus Hardebeck, Ludwigshafen (Rhine), and Wolfgang Schaumann, Heidelberg, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

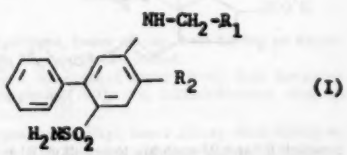
Filed June 25, 1974, Ser. No. 482,956

Claims priority, application Germany, July 10, 1973, 2334973

Int. Cl.² C07D *237/00, 239/00, 241/00, 251/00*

U.S. Cl. 260—239.6 **7 Claims**

1. Biphenyl compounds of the formula:



(I)

wherein
R_1 is furyl or thienyl; and
R_2 is carboxyl;
and the pharmacologically acceptable salts thereof.

3,959,262

METHOD FOR PREPARING AZINES

Henri Mathais, Foy-les-Lyon; Jean-Pierre Schirmann, Brignais; Pierre Tellier, Oullins, and Francis Weiss, Pierre-Benite, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Sept. 20, 1972, Ser. No. 290,507
Claims priority, application France, Oct. 8, 1971, 71.36311
Int. Cl.² C07C 119/00
U.S. Cl. 260—240 G 5 Claims

1. A method for preparing azines which consists of reacting in the liquid phase

a. ammonia;

b. a carbonyl compound selected from formaldehyde, acetaldehyde, propionaldehyde, butyraldehyde, isobutyraldehyde, n-valeric aldehyde, pival aldehyde, oenanthal, 2-ethylhexanal, hexahydrobenzaldehyde, benzaldehyde, p-chlorobenzaldehyde, p-nitrobenzaldehyde, β-methoxypropionaldehyde, β-ethoxypropionaldehyde, acetone, 2-butanone, 2-pentanone, 3-pentanone, methylisopropylketone, methylisobutylketone, methylcyclohexylketone, acetophenone, benzophenone, cyclobutanone, cyclopentanone, cyclohexanone, 2-methylcyclohexanone, 3-methylcyclohexanone, 4-methylcyclohexanone, 2,4-dimethylcyclohexanone, 3,3,5-trimethylcyclohexanone, cycloheptanone, cyclooctanone, cyclodecanone, and cyclododecanone, and mixtures thereof; and

c. a percarboxylic acid selected from performic, peracetic, peroxypropionic, peroxybutyric, peroxyisobutyric, peroxyvaleric, peroxyisovaleric, peroxypivalic, peroxyhexanoic, peroxyheptanoic, peroxyoctanoic, α,α′-dimethylperoxyoctanoic, peroxylauric, peroxypalmitic, peroxystearic, hexahydroperoxybenzoic, trifluoroperacetic, β-chloroperoxypropionic, β-methoxyperoxypropionic, β-hydroxyperoxycaproic, peroxybenzoic and its chloro, bromo, fluoro, methoxy, nitro and trifluoromethyl derivatives, peroxytoluic, peroxysuccinic, peroxyglutaric, peroxyadipic, peroxycrotonic, peroxymaleic, peroxyfumaric and peroxyphthalic acid, and mixtures thereof,

and recovering the azine or mixture of azines from the reaction medium.

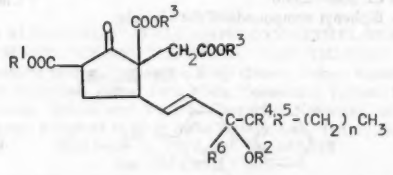
3,959,263

PROSTAGLANDIN INTERMEDIATE

Nedumparambil A. Abraham, Dollard des Ormeaux; Jehan F. Bagli, Kirkland, and Tibor Bogri, Montreal, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed June 19, 1974, Ser. No. 480,788
Int. Cl.² C07C 61/38, 69/74
U.S. Cl. 260—240 R 5 Claims

1. A compound of the formula



in which R^1 and R^3 each are lower alkyl, R^2 is hydrogen or a hydroxy protecting radical selected from the group consisting of acetals, tri (lower) alkylsilyl or tert-butyl, R^4, R^5 and R^6 each are hydrogen or lower alkyl and *n* is an integer from two to five, with the proviso that at least one of R^4, R^5 or R^6 is hydrogen.

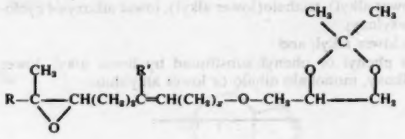
3,959,264

SYNTHETIC HORMONES FOR INSECT CONTROL

William S. Bowers, Bowie, Md., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 363,294, May 23, 1973, which is a division of Ser. No. 78,577, Oct. 6, 1970, abandoned. This application July 2, 1975, Ser. No. 592,696
Int. Cl.² C07D 303/04, 317/12
U.S. Cl. 260—240 R 3 Claims

1. A compound of the general formula



wherein R and R′ are selected from the group consisting of methyl and ethyl; and x is a number from 1 to 2.

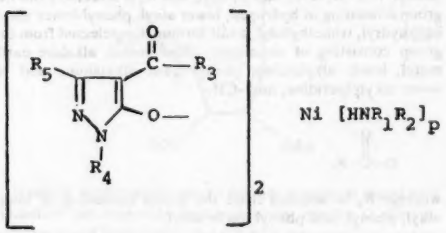
3,959,265

ORGANIC COMPOUNDS

Lajos Avar, Binningen, and Kurt Hofer, Munchenstein, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed May 7, 1975, Ser. No. 575,157
Claims priority, application Switzerland, May 13, 1974, 6492/74
Int. Cl.² C07D 231/22; C07F 15/04; C08K 5/34; C07D 231/26
U.S. Cl. 260—242 15 Claims

1. A nickel complex of the formula



wherein either

R_1 is hydrogen, alkyl(C_1-C_8) or -CH_2CH_2OH

and

R_2 is alkyl(C_1-C_{18}); alkyl(C_1-C_{18}) substituted by 1 hydroxyl, 1 alkoxy(C_1-C_4), 1 piperidino or 1 morpholino substituent; cyclohexyl; phenylalkyl(C_7 or C_8); phenylalkyl(C_7 or C_8) substituted on the phenyl nucleus by 1 or 2 alkyl(C_1-C_4) and/or 1 hydroxyl substituent; phenyl; phenyl substi-

tuted by 1 alkyl(C_1-C_{12}), 1 chlorine, 1 phenyl or 1 phenyl substituted by 1 hydroxyl and/or 1 or 2 alkyl(C_1-C_4) substituents;

or

R_1 and R_2 together with the -NH- group to which they are bound form a piperidine, morpholine, pyrrolidine or imidazoline ring,

R_3 is alkyl(C_1-C_{22}); alkyl(C_1-C_{21})thio-alkyl(C_1-C_{21}) with C_2-C_{22} in the aggregate thereof; alkyl(C_1-C_4) substituted by 1 or 2 chlorines; cycloalkyl(C_5-C_{12}); cycloalkyl(C_5-C_{11})alkyl(C_1-C_7) with C_6-C_{18} in the aggregate thereof; phenylalkyl(C_7-C_{12}); phenylalkyl(C_7-C_{12}) substituted on the phenyl nucleus thereof by 1 or 2 hydroxyl and/or 1 or 2 alkyl(C_1-C_{12}), 1 cycloalkyl(C_5-C_{12}) or 1 cycloalkyl(C_5-C_{11})alkyl(C_1-C_7) with C_6-C_{12} in the aggregate thereof; phenyl; phenyl substituted by 1 or 2 halogen, 1 cyano, 1 meta- or para-hydroxyl, 1 or 2 alkyl(C_1-C_{12}), 1 or 2 alkoxy(C_1-C_{12}), 1 phenyl and/or 1 R_6-O- or R_6-SO_2-substituent wherein R_6 is phenyl or phenyl substituted by 1 or 2 alkyl(C_1-C_8) substituents having 1 to 3 substituents and a maximum of C_{18} in the aggregate of the substituents; or a heterocyclic substituent selected from furyl, thienyl, benzothienyl, indolyl, pyridyl and quinoxalinyl unsubstituted or substituted by 1 or 2 halogen, 1 or 2 alkyl(C_1-C_4) and/or 1 or 2 alkoxy(C_1-C_4) substituents with a maximum of 2 substituents;

R_4 and R_5 are each, independently, alkyl(C_1-C_8), phenyl or phenyl substituted by 1 halogen and/or 1 or 2 alkyl(C_1-C_4) substituents,

and

p is 1 when the amine ligand is bidentate

and

p is 2 when the amine ligand is monodentate.

3,959,266

PROCESS FOR THE CONVERSION OF PENICILLIN S-OXIDE INTO A CORRESPONDING DESATOXYCEPHALOSPORIN

Leone Dall'Asta, Milan, Italy, assignor to Societe Anonyme dite: CLIN-MIDY, Paris, France

Filed June 22, 1973, Ser. No. 372,638

Claims priority, application United Kingdom, June 30, 1972, 30674/72

Int. Cl.² C07D *501/10*

U.S. Cl. 260—243 C **12 Claims**

1. A process for converting a penicillin S-oxide selected from the group consisting of a 6-acylamido-penicillanic acid S-oxide and esters thereof, into the corresponding desacetoxycephalosporin, comprising:

effecting said conversion by heating said penicillin S-oxide to a temperature of 70° to 140°C in the presence of an amount of dimethyl sulfoxide effective for converting said penicillin S-oxide to the corresponding desacetoxycephalosporin.

3,959,267

3-(2'-TETRAHYDROPYRANYLMETHYL)-7-(2-THIENYLACETAMIDO)-3-CEPHEM-4-CARBOXYLIC ACID AND NON-TOXIC SALTS THEREOF

John Herbert Charles Nayler, Dorking; Michael John Pearson, Roffey, and Robert Southgate, Barns Green, all of England, assignors to Beecham Group Limited, England

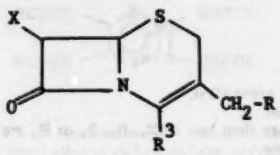
Division of Ser. No. 303,959, Nov. 6, 1972, abandoned. This application Aug. 30, 1974, Ser. No. 501,961

Claims priority, application United Kingdom, Jan. 3, 1972, 142/72; Apr. 21, 1972, 18694/72; Sept. 9, 1972, 41972/72

Int. Cl.² C07D *501/56*

U.S. Cl. 260—243 C **2 Claims**

1. A compound of the formula:



wherein X is 2-thienylacetamido; R^3 is a carboxylic acid group or a non-toxic salt thereof; and R is 2'-tetrahydropyranyl.

3,959,268

PHENTHIAZINE DERIVATIVES

Jean-Claude René Georges Blondel, Savigny-sur-Orge (Essonne); Jean Clément Louis Fouche, Bourg-la-Reine (Hauts-de-Seine), and Claude Georges Alexandre Guéremy, Creteil (Val-de-Marne), all of France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed Nov. 14, 1974, Ser. No. 523,750

Claims priority, application France, Mar. 29, 1967, 67.1000663

The portion of the term of this patent subsequent to Apr. 1, 1992, has been disclaimed.

Int. Cl.² C07D *279/28*

U.S. Cl. 260—243 A **2 Claims**

1. The phenthiazine derivative which is 3-Dimethylsulphamoyl-10- 3-[4-(2-2'-methylhexadecanoyloxy-ethyl)-piperidino]propyl phenthiazine.

3,959,269

2-SUBSTITUTED-3-DISUBSTITUTED-4,5,6,7-SUBSTITUTED OR UNSUBSTITUTED PHTHALIMIDINES

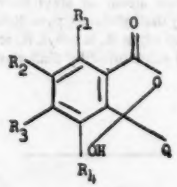
William J. Houlihan, Baden, Austria, and Jeffrey Nadelson, Lake Parsippany, N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 232,615, March 7, 1972, Pat. No. 3,849,438, which is a continuation-in-part of Ser. No. 126,272, March 19, 1971, abandoned. This application July 12, 1974, Ser. No. 488,041

Int. Cl.² C07D *493/00*

U.S. Cl. 260—343.3 R **1 Claim**

1. A compound of the formula:



where R_1 is hydrogen, lower alkoxy, halo having an atomic weight of 19 to 36, or trifluoromethyl,

R_2 is hydrogen, lower alkyl, lower alkoxy, halo having an atomic weight of 19 to 36, trifluoromethyl, nitro or amino,

R_3 is hydrogen, lower alkyl, lower alkoxy, halo having an atomic weight of 19 to 36, trifluoromethyl, nitro, amino, dialkylamino or phenyl,

R_4 is hydrogen, lower alkyl, lower alkoxy, or trifluoromethyl,

R_6 and R_7 together are $-(CH_2)_n$ where n is 4, 5, or 6,

R_8 is methyl, vinyl or allyl, or

where R_9 is lower alkyl,
provided that

1. no more than two of R_1, R_2, R_3 or R_4 are other than hydrogen,
2. when either of R_1 or R_3 is halo, the other of R_1 or R_3 is not halo,
3. only one of R_1 and R_3, or R_2 and R_4 is alkoxy at one time,
4. there are no two trifluoromethyl groups on adjacent carbon atoms,
5. only one of R_2 or R_3 is nitro or amino.

3,959,270

SUBSTITUTED (5,6,E) INDOLES

Claude P. Fauran; Guy M. Raynaud; Michel J. Turin, and Claude J. Gouret, all of Paris, France, assignors to Delalande S.A., Courbevoie, France

Continuation-in-part of Ser. No. 260,298, June 6, 1972, Pat. No. 3,852,284. This application Mar. 21, 1974, Ser. No. 453,425

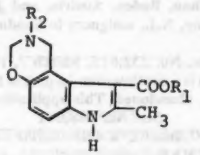
Claims priority, application France, Mar. 21, 1973, 73.10202

The portion of the term of this patent subsequent to Dec. 3, 1991, has been disclaimed.

Int. Cl.² C07D *279/00, 285/00, 295/00*

U.S. Cl. 260—244 R **14 Claims**

1. A compound having the formula



in which R_1 is alkyl having 1 to 4 carbon atoms, and R_2 is alkyl having 1 to 4 carbon atoms or alkyl having 1 to 4 carbon atoms substituted by dialkylamino, pyrrolidino or morpholino, with the proviso that when R_1 is ethyl, R_2 is not ethyl, propyl, or ethyl and propyl substituted by dialkylamino.

3,959,271

S,S-DIALKYL-N-SUBSTITUTED PHOSPHOROAMIDOTHIOATES

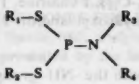
Francis J. Freenor, III, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 466,433, May 2, 1974, Pat. No. 3,886,238. This application Apr. 7, 1975, Ser. No. 565,924

Int. Cl.² C07D *295/22*

U.S. Cl. 260—247.1 B **7 Claims**

1. A compound of the formula



where R_1 is alkyl of 1 to 8 carbon atoms or alkenyl of 2 to 8 carbon atoms, R_2 is alkyl of 1 to 8 carbon atoms or alkenyl of 2 to 8carbon atoms, and R_3 and R_4 are jointed to form an alkylene group of 2 to 5 carbon atoms.

3,959,272

AMINOALKYL ESTERS OF 2-ANILINO-NICOTINIC ACIDS

Charles Hoffmann, Enghien-les-Bains, France, assignor to Societe Anonyme dite: Hexachime, France

Filed June 4, 1973, Ser. No. 366,610

Claims priority, application France, June 7, 1972, 72.20490

Int. Cl.² C07D *295/00*

U.S. Cl. 260—247.2 B **1 Claim**

1. The compound β-morpholinoethyl 2(2,3-dimethylanilino)nicotinate or a non-toxic acid addition salt thereof.

3,959,273

MORPHOLINE DERIVATIVES

Keith Blakeney Mallion; Ralph William Turner, and Alexander Henry Todd, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 301,333, Oct. 27, 1972, Pat. No. 3,876,769, which is a continuation-in-part of Ser. No. 685,302, Nov. 24, 1967, Pat. No. 3,714,161. This application Sept. 27, 1974, Ser. No. 510,058

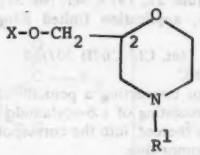
Claims priority, application United Kingdom, Dec. 28, 1966, 57963/66

The portion of the term of this patent subsequent to Jan. 30, 1990, has been disclaimed.

Int. Cl.² C07D *295/08*

U.S. Cl. 260—247.7 S **2 Claims**

1. A morpholine selected from compounds of the formula:



wherein R^1 is hydrogen and wherein X is phenyl which is substituted by one substituent selected from o-alkoxy of up to 3 carbon atoms, o-methyl, o-allyl, o-allyloxy, o-chloro or o-phenyl, and the non-toxic, pharmaceutically-acceptable acid-addition salts thereof.

3,959,274

PREPARATION OF ALKALI METAL AND QUATERNARY NITROGEN DOUBLE SALTS OF SILICIC ACID

Helmut Hans Wilhelm Weldes, Havertown, Pa., assignor to Philadelphia Quartz Company, Valley Forge, Pa.

Continuation of Ser. No. 776,242, Nov. 15, 1968, Pat. No. 3,769,309, which is a continuation of Ser. No. 614,027, Feb. 6, 1967, abandoned, which is a continuation of Ser. No. 500,328, Oct. 21, 1965, Pat. No. 3,383,386, which is a continuation of Ser. No. 50,877, Aug. 22, 1960, Pat. No. 3,239,549. This application July 9, 1973, Ser. No. 377,690

Int. Cl.² C07F *7/10*

U.S. Cl. 260—247.7 L **4 Claims**

1. A process for preparing quaternary ammonium silicates which comprises reacting an alkylene oxide, a heterocyclic

amine compound selected from the group consisting of morpholine, piperazine compounds and pyrrolidine compounds; and an alkali metal silicate in an aqueous system, crystallizing and recovering the crystallized product.

3,959,275

FUSED RING N-[1-(3-CYANO-3,3-DIPHENYLPROPYL)-4-PHENYLPIPERIDINE-4-CARBONYLOXY]IMIDES

Eunice M. Kreider, Chicago, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 208,442, Dec. 15, 1971, Pat. No. 3,847,923. This application May 28, 1974, Ser. No. 473,750

Claims priority, application United Kingdom, Dec. 16, 1970, 59686/70

Int. Cl.² C07D *253/08*

U.S. Cl. 260—248 AS **1 Claim**

1. A compound which is 3-[1-(3-cyano-3,3-diphenylpropyl)-4-phenylpiperidine-4-carbonyloxy]-3H-1,2,3-benzotriazin-4-one and the hydrochloride salt thereof.

3,959,276

ANTIBACTERIAL PRODUCT

Jerome S. Luloff, Bloomington, Minn., and Albert L. Ellender, Flanders, N.J., assignors to Cosan Chemical Corporation, Clifton, N.J.

Division of Ser. No. 403,819, Oct. 5, 1973. This application Nov. 26, 1974, Ser. No. 527,364

Int. Cl.² C07D *251/04*

U.S. Cl. 260—248.5 **2 Claims**

1. A method for preparing the two-to-one quaternary ammonium adduct of hexamethylenetetramine and 3,4-dichlorobutene-1 which comprises reacting 3,4-dichlorobutene-1 with hexamethylenetetramine at a temperature of less than about 130°C. in an inert organic solvent in which the adduct is substantially insoluble.

3,959,277

DIIMIDAZOPYRAZINES AND TETRACARBOXAMIDOPYRAZINES

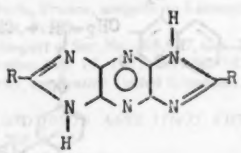
Dennis Scott Donald, Mendenhall, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 271,938, July 14, 1972, Pat. No. 3,808,209. This application Feb. 20, 1974, Ser. No. 444,542

Int. Cl.² C07D *241/26*, *241/250*

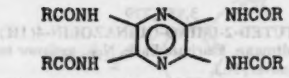
U.S. Cl. 260—250 BC **10 Claims**

1. A diimidazopyrazine of the formula



wherein the R's are the same and are selected from the group consisting of lower alkyl of up to 8 carbons, aryl hydrocarbon of 6 to 12 carbons, and aryl hydrocarbon of 6 to 12 carbons substituted with up to two substituents selected from the group consisting of lower alkyl of up to 8 carbons, lower alkoxy of up to 8 carbons, phenoxy, bromo and nitro or up to five substituents selected from the group consisting of fluoro and chloro.

6. A tetra-substituted-amidopyrazine of the formula



wherein the R's are the same and are selected from the group consisting of lower alkyl of up to 8 carbons, aryl hydrocarbon of 6 to 12 carbons, and aryl hydrocarbon of 6 to 12 carbons substituted with up to two substituents selected from the group consisting of lower alkyl of up to 8 carbons, lower alkoxy of up to 8 carbons, phenoxy, bromo and nitro, or up to five substituents selected from the group consisting of fluoro and chloro.

3,959,278

METHOD OF SYNTHESIS OF PTERIDINES

Hamish Christopher Swan Wood, Glasgow, Scotland; Alexander Stuart, Bromley; Adrian Charles Ward Curran, Harrow, both of England, and Saieba Al-Hassan, Baghdad, Iraq, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

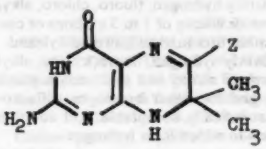
Division of Ser. No. 162,297, July 13, 1971, Pat. No. 3,810,893. This application Feb. 14, 1974, Ser. No. 442,494

Claims priority, application United Kingdom, July 27, 1970, 36289/70

Int. Cl.² C07D *475/04*

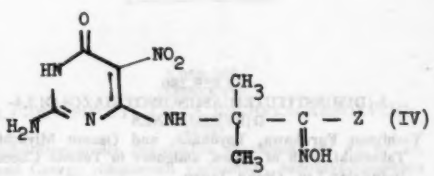
U.S. Cl. 260—251.5 **6 Claims**

1. A method of preparing a compound of formula (II)



(II)

comprising the step of effecting reductive cyclisation of a compound of formula (IV)



(IV)

wherein Z is lower alkyl or hydroxymethyl and wherein said reductive cyclisation is carried out by catalytic hydrogenation using palladium on charcoal, platinum or Raney nickel as the catalyst, or by reduction with sodium dithionite.

3,959,279

1-SUBSTITUTED-2-IMINO-QUINAZOLIN-4(1H)ONES

Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

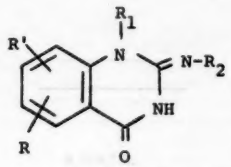
Continuation-in-part of Ser. No. 437,469, Jan. 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 373,476, June 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 339,370, March 8, 1973, abandoned. This application July 24, 1974, Ser. No. 491,214

The portion of the term of this patent subsequent to Feb. 3, 1993, has been disclaimed.

Int. Cl.[2] C07D *239/95*

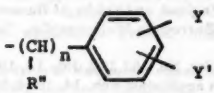
U.S. Cl. 260—256.4 Q 22 Claims

1. A compound of the formula



wherein

R_1 is alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 8 carbon atoms or phenalkyl of the formula:



n is 1 or 2

R'' is hydrogen or methyl provided that R'' is hydrogen when *n* is 2,

R_2 is hydrogen, alkyl of 1 to 6 carbon atoms or alkenyl of 3 to 6 carbon atoms,

R and R' are independently hydrogen, fluoro, chloro, alkyl of 1 to 3 carbon atoms or alkoxy of 1 to 3 carbons or one is hydrogen and the other bromo or trifluoromethyl, and

Y and Y' are independently hydrogen, fluoro, chloro, alkyl of 1 to 3 carbon atoms or alkoxy of 1 to 3 carbon atoms or one is hydrogen and the other bromo or trifluoromethyl, or a pharmaceutically acceptable acid addition salt of the compounds in which R_2 is hydrogen.

3,959,280

3-(DISUBSTITUTED)AMINOISOTHIAZOLO[3,4-D]PYRIMIDINES

Yoshiyasu Furukawa, Toyonaka, and Osamu Miyashita, Takatsuki, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

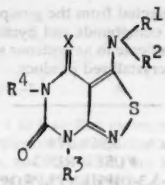
Filed Nov. 11, 1974, Ser. No. 522,863

Claims priority, application Japan, Nov. 12, 1973, 48-127050

Int. Cl.[2] C07D *239/00*

U.S. Cl. 260—256.5 R 26 Claims

1. A compound selected from the group consisting of compounds of the formula



wherein

R^1, R^2 and R^3, independently of each other, are selected from the group consisting of (1) alkyl of up to 5 carbon atoms, (2) alkyl of up to 5 carbon atoms, substituted by hydroxy, halogen, lower alkoxy, nitro or lower acyloxy, (3) alkenyl of up to 5 carbon atoms, (4) alkenyl of up to 5 carbon atoms, substituted by hydroxy, halogen, lower alkoxy, nitro or lower acyloxy, (5) phenyl, (6) phenyl substituted by lower alkyl, halogen, lower alkoxy or nitro, (7) naphthyl, (8) naphthyl substituted by lower alkyl, halogen, lower alkoxy or nitro, (9) aralkyl of 7–11 carbon atoms, (10) aralkyl of 7–11 carbon atoms, substituted by lower alkyl, halogen, lower alkoxy or nitro, (11) aralkenyl of 7–11 carbon atoms and (12) aralkenyl of 7–11 carbon atoms substituted by lower alkyl, halogen, lower alkoxy or nitro,

R^4 is hydrogen or alkyl of up to 5 carbon atoms, and

X is oxygen or imino, and tautomers thereof, with the proviso that when X is imino R^4 is hydrogen.

3,959,281

PIPERAZINO SUBSTITUTED COUMARIN DERIVATIVES

Rudi Beyerle, Bruchkobel, Germany; Adolf Stachel, deceased, late of Germany; Ingeburg Lydia Katharina Stachel, heiress, Frankfurt am Main-Fechenheim, Germany; Rolf-Eberhard Nitz, Bergen-Enkheim, Germany; Klaus Resag, and Eckhard Schraven, both of Frankfurt am Main-Fechenheim, Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt am Main-Fechenheim, Germany

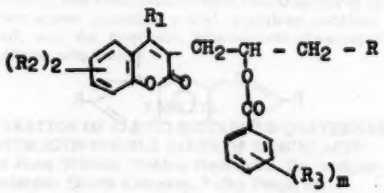
Division of Ser. No. 789,919, Jan. 8, 1969, Pat. No. 3,652,557. This application July 27, 1971, Ser. No. 166,600

Claims priority, application Germany, Jan. 19, 1968, 1668877

Int. Cl.[2] C07D *405/10, 405/06*

U.S. Cl. 260—268 BC 6 Claims

1. A coumarin compound having the structural formula



or the hydrochloric acid addition salts thereof, wherein R is selected from the group consisting of piperazino, N-(β-hydroxyethyl)-piperazino, N-(γ-hydroxypropyl)-piperazino, N-(4-chlorophenyl)-piperazino, N-(2,3,4-trimethoxybenzyl)-piperazino, N-(3,4-dimethoxybenzyl)-piperazino, N-(2,6-dimethylphenyl-carbamoylmethyl)-piperazino, and N-(3,4,5-

trimethoxyphenylcarbamoylmethyl)-piperazino and is bound via a nitrogen atom; R_1 is selected from the group consisting of alkyl groups having 1–4 carbon atoms; R_2 is selected from the group consisting of 5,7-, 6,7-, and 7,8-positioned alkoxy groups having 1–4 carbon atoms; R_3 is selected from alkoxy groups having 1–4 carbon atoms; and *m* is selected from the group consisting of 1, 2, and 3.

3,959,282

10-PIPERAZINO-4H-THIENO[2,3-C] [1]BENZAZEPINES

Fritz Hunziker, Berne, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

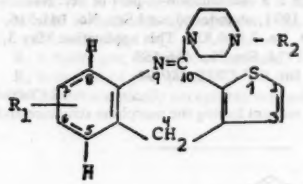
Filed Mar. 21, 1975, Ser. No. 561,002

Claims priority, application Switzerland, Mar. 26, 1974, 4189/74

Int. Cl.² C07D *495/04*

U.S. Cl. 260—268 TR **20 Claims**

1. A compound of formula I,



I

where

R_1 is hydrogen, halogen, or alkyl, alkoxy or alkylthio of 1 to 4 carbon atoms, or trifluoromethyl, and

R_2 is hydrogen, or alkyl, hydroxyalkyl or acetoxyalkyl, the alkyl moiety having at most 4 carbon atoms, or alkoxyalkyl having at most 6 carbon atoms,

or a pharmaceutically acceptable acid addition salt thereof.

3,959,283

AMINO-DERIVATIVES OF 1,4-BENZODIOXAN

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, Maisons-Alfort, France

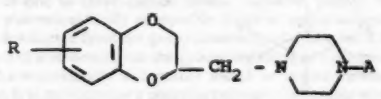
Continuation-in-part of Ser. No. 408,947, Oct. 23, 1973. This application Jan. 17, 1975, Ser. No. 542,023

Claims priority, application United Kingdom, Jan. 25, 1974, 3547/74

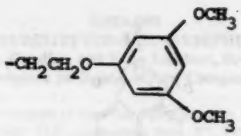
Int. Cl.² C07D *295/10*; A61K *31/495*; C07D *405/06*

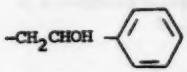
U.S. Cl. 260—268 BC **6 Claims**

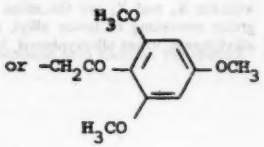
1. A compound of formula:



in which R is hydrogen or alkyl of 1 to 5 carbon atoms; and A is $-CH(CH_3)COOC_2H_5$,







or a non-toxic acid addition salt thereof.

3,959,284

BIS (2-BENTHIAZOLE-DITHIO)-N,N'-PIPERAZINES AND THEIR USE AS VULCANIZING AGENTS

Rüdiger Schubart, and Ulrich Eholzer, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Mar. 28, 1972, Ser. No. 238,979

Claims priority, application Germany, Mar. 30, 1971, 2115294

Int. Cl.² C07D *295/22*

U.S. Cl. 260—268 BC **3 Claims**

1. Bis-(2-benzthiazole-dithio)-N,N'-piperazine.

3,959,285

IMIDES OF 1,1'-DINAPHTHYL-4,4',5,5',8,8'-HEXACARBOXYLIC ACID

Nikolai Stepanovich Dokunikhin, Presnensky val, 42, kv. 23, and Georgy Nikolaevich Vorozhtsov, Sadovaya-Spasskaya ulitsa, 21, kv. 268, both of Moscow, U.S.S.R.

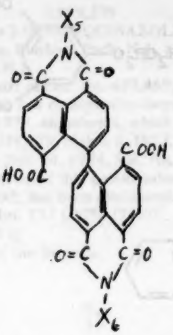
Filed Apr. 24, 1972, Ser. No. 246,521

Claims priority, application U.S.S.R., Apr. 28, 1971, 1646220

Int. Cl.² C07D *217/24*

U.S. Cl. 260—281 NH **8 Claims**

1. Compounds represented by the formula:



wherein X_5 and X_6 are the same groups selected from the group consisting of lower alkyl, cyclohexyl, phenyl, lower alkylphenyl, lower alkoxyphenyl, halophenyl and 2-pyridyl.

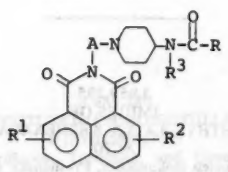
3,959,286

N-[1-[1,3-DIHYDRO-1,3-DIOXO-2H-BENZ[DE]-ISOQUINOLIN-2-YL)ALKYL]-4-PIPERIDINYL]-N-PHENYLALKYLAMIDES

Peter C. Wade, Pennington, N.J., and Berthold Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 6, 1975, Ser. No. 538,977
Int. Cl.² C07D *401/06*
U.S. Cl. 260—281 NH **9 Claims**

1. A compound of the formula:



wherein R^1 and R^2 are each independently selected from the group consisting of hydrogen, halogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, nitro, cyano, amino, and trifluoromethyl; A is a straight or branched chain alkylene of 1 to 8 carbons; R is selected from the group consisting of lower alkyl of 1 to 4 carbons and cycloalkyl of 3 to 7 carbons; and R^3 is selected from the group consisting of phenyl and substituted phenyl wherein said substituent is lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, fluorine, bromine, chlorine, di(bromo), di(chloro), di(methyl), di(methoxy), lower alkylthio of 1 to 4 carbons, CF_3, nitro or amino; and a pharmaceutically acceptable acid addition salt thereof.

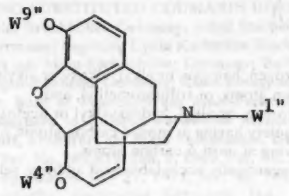
3,959,287

LIGAND DETERMINATION OF SPIN LABELED COMPOUNDS BY RECEPTOR DISPLACEMENT

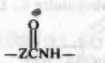
Avram Goldstein, Stanford; Richard K. Leute, Sunnyvale, and Edwin F. Ullman, Atherton, all of Calif., assignors to Syva Company, Palo Alto, Calif.

Division of Ser. No. 270,108, July 10, 1972, Pat. No. 3,853,914, which is a continuation-in-part of Ser. Nos. 105,535, Jan. 11, 1971, abandoned, and Ser. No. 141,516, May 10, 1971, Pat. No. 3,690,834. This application May 3, 1974, Ser. No. 466,650
Int. Cl.² C07D *489/04*
U.S. Cl. 260—285 **6 Claims**

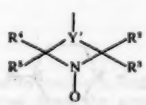
1. A spin labeled reagent having the morphine structure and of the formula:



wherein:
one of W^1 and W^9 is —X*—A*;
when other than —X*—A*
W^1 is methyl; and
W^9 is hydrogen, methyl or glucuronyl;
W^4 is hydrogen or acetyl;
-X* is



wherein Z is aliphatic hydrocarbylene of from 1 to 7 carbon atoms, having from 0 to 1 site of ethylenic unsaturation and bonded to said morphine structure; and
—A* is of the formula:



wherein R^5-5 is alkyl of from 1 to 3 carbon atoms and Y' is a trivalent aliphatic hydrocarbylene of from 1 to 3 carbon atoms, having from 0 to 1 site of ethylenic unsaturation.

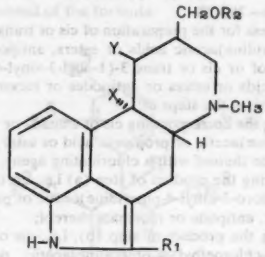
3,959,288

8-OXYMETHYLERGOLINES AND PROCESS THEREFOR

Nicholas J. Bach, and Edmund C. Kornfeld, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 13, 1974, Ser. No. 532,333
Int. Cl.² C07D 457/02
U.S. Cl. 260—285.5 12 Claims

1. A compound of the formula



wherein:

X and Y both are hydrogen or, taken together, form a double bond;

R_1 is hydrogen, chlorine, or bromine;

R_2 is methyl or phenyl; and

the pharmaceutically acceptable acid addition salts thereof.

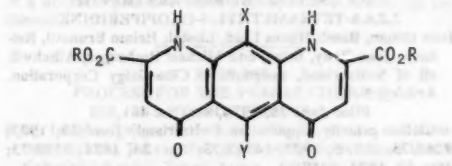
3,959,289

DERIVATIVES OF 4,6 DIOXOPYRIDO[3,2-G]QUINOLINE 2,8 DICARBOXYLIC ACID

Charles M. Hall; Herbert G. Johnson, and John B. Wright, all of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 303,971, Nov. 6, 1972, which is a continuation-in-part of Ser. No. 233,772, March 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 230,034, Feb. 28, 1972, abandoned. This application Dec. 11, 1974, Ser. No. 531,759
Int. Cl.² C07D 471/04
U.S. Cl. 260—287 CF 6 Claims

1. A compound of the formula



wherein

R is selected from the group consisting of hydrogen, alkyl of one to three carbon atoms, inclusive, phenyl, and a pharmaceutically acceptable metal or amine cation;

X is selected from the group consisting of cyano and COOQ where Q is selected from the group consisting of hydrogen and a pharmaceutically acceptable metal or amine cation and when R is hydrogen or a pharmaceutically acceptable metal or amine cation, Q is the same as R; and

Y is selected from the group consisting of hydrogen, alkyl of one to four carbon atoms, inclusive; halogen and alkoxy of one to four carbon atoms, inclusive.

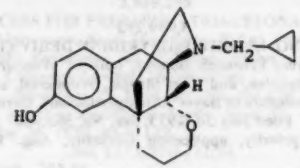
3,959,290

3,14-SUBSTITUTED-8-OXAMORPHINANS

Ivo Monkovic, Candiac, and Yvon Lambert, Brossard, both of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 380,515, July 18, 1973, Pat. No. 3,853,889. This application Nov. 27, 1974, Ser. No. 527,667
The portion of the term of this patent subsequent to Dec. 10, 1991, has been disclaimed.
Int. Cl.² C07D 491/04
U.S. Cl. 260—293.55 5 Claims

1. A compound having the formula



or a pharmaceutically acceptable acid addition salt thereof.

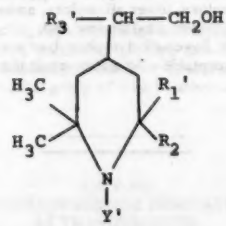
3,959,291

PIPERIDINE DERIVATIVES

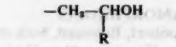
Barry Cook, Manchester, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 1, 1974, Ser. No. 438,808
Claims priority, application United Kingdom, Feb. 3, 1973, 5470/73
Int. Cl.² C07D 211/22
U.S. Cl. 260—293.66 4 Claims

1. A compound having the formula



wherein R_1' and R_2' are the same or different and each is an alkyl residue having from 1 to 12 carbon atoms, or R_1', and R_2' together with the carbon atoms to which they are bound, form a cycloalkyl residue having from 5 to 12 carbon atoms in the ring, Y_1 is a straight- or branched alkyl residue having from 1 to 20 carbon atoms, or alkenyl or alkynyl residue having from 3 to 12 carbon atoms, or an aralkyl residue having from 7 to 12 carbon atoms and being selected from benzyl, β-methylbenzyl, p-methylbenzyl or a, p-dimethylbenzyl,



and R_3' is hydrogen or a straight- or branched chain alkyl residue having from 1 to 12 carbon atoms.

3,959,292

2-AMINO-4,5-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer; Friedrich Bossert, both of Wuppertal; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

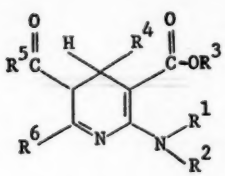
Filed July 30, 1973, Ser. No. 383,962

Claims priority, application Germany, Aug. 12, 1972, 2239815

Int. Cl.² C07D 295/14

U.S. Cl. 260—293.69 31 Claims

1. A compound of the formula:



herein

R^1 when taken independently is hydrogen or lower alkyl;

R^2 when taken idependently is lower alkyl or benzyl; or

R^1 and R^2 together with the nitrogen atom to which they are attached form a cyclic amine wherein R^1 and R^2 together represent alkylene of 4 to 7 carbon atoms;

R^3 is lower alkyl, lower alkenyl or lower alkylnyl;

R^4 is lower alkyl; lower alkenyl; lower alkynyl; phenyl phenyl substituted by one to three members selected from the group consisting of lower alkyl, lower alkoxy, halogeno, nitro, cyano, trifluoromethyl, azido, carbo (lower alkoxy), lower alkylsulfonyl, lower alkylsulfinyl, lower alkylthio and phenyl; or naphthyl;

R^5 is lower alkyl, lower alkoxy, lower alkoxy(lower alkoxy), lower alkenyloxy, lower alkynyloxy, amino, lower alkylamino or di(lower alkyl)amino; and

R^6 is hydrogen, lower alkyl or phenyl; or a nontoxic physiologically acceptable acid addition salt thereof.

3,959,293

METHYL 1-(3,4-DICHLOROBENZYL)-2,3-DIOXOISONIPECOTATE

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Continuation-in-part of Ser. No. 509,334, Sept. 26, 1974, abandoned. This application Apr. 3, 1975, Ser. No. 564,609

Int. Cl.² C07D 211/42

U.S. Cl. 260—293.76 1 Claim

1. Methyl 1-(3,4-dichlorobenzyl)-2,3-dioxoisonipecotate.

3,959,294

PROCESSES AND INTERMEDIATES FOR CIS OR TRANS 2- OR 3-(1-ACYL-3-VINYL-4-PIPERIDINE)ACETIC OR PROPIONIC ACID ESTERS

Guenter Grethe, North Caldwell, and Milan Radoje Uskokovic, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 362,604, May 21, 1973, which is a division of Ser. No. 100,370, Dec. 21, 1970, abandoned. This application May 23, 1975, Ser. No. 580,493

Int. Cl.² C07D 211/34

U.S. Cl. 260—293.88 2 Claims

1. A process for the preparation of cis or trans 2-(1-acyl-3-vinyl-4-piperidine)acetic acids or esters, antipodes or racemates thereof or cis or trans 3-(1-acyl-3-vinyl-4-piperidine) propionic acids or esters or antipodes or racemates thereof which comprises the steps of:

a. treating the corresponding cis or trans 2- or 3-(3-ethyl-4-piperidine)acetic or propionic acid or ester, antipode or racemate thereof with a chlorinating agent;

b. irradiating the product of step (a) i.e., cis or trans 2- or 3-(1-chloro-3-ethyl-4-piperidine)acetic or propionic acid or ester, antipode or racemate thereof;

c. treating the product of step (b), i.e., cis or trans 2- or 3-[3-(2-chloroethyl)-4-piperidine]acetic or propionic acid or ester, antipode or racemate thereof, with an acid chloride;

d. treating the product of step (c), i.e., cis or trans 2- or 3-[1-acyl-3-(2-chloroethyl)-4-piperidine]acetic or propionic acid or ester, antipode or racemate thereof, with an alkali metal iodide; and

e. treating the product of step (d), i.e., cis or trans 2- or 3-[1-acyl-3-(2-iodoethyl)-4-piperidine]acetic or propionic acid or ester, antipode or racemate thereof, with an organic base or inorganic salt to yield the desired end product.

3,959,295

PROCESS FOR THE PREPARATION OF 2,2,6,6-TETRAMETHYL-4-OXOPIPERIDINE

Ivan Orban, Basel; Hanns Lind, Liestal; Heimo Brunetti, Reinach; Jean Rody, Basel, and Michael Rasberger, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 21, 1974, Ser. No. 481,922

Claims priority, application Switzerland, June 25, 1973, 9241/73; Oct. 5, 1973, 14257/73; Apr. 24, 1974, 5599/73; May 22, 1974, 7018/73

Int. Cl.² C07D 211/74

U.S. Cl. 260—293.89 53 Claims

1. Process for the preparation of 2,2,6,6-tetramethyl-4-oxopiperidine, wherein

a. acetone is reacted with ammonia in the presence of 0.2–12 mol-%, relative to the acetone used, of an acid catalyst at 5°–60°C, and

b. the reaction is completed, with or without the addition of further acetone, by further heating, with the total amount of acetone used in the reaction being with respect to the employed amount of ammonia in a molar ratio equal to or greater than 1.6 : 1.

3,959,296

1,4-DIHYDROPYRIDINES

Friedrich Bossert; Horst Meyer, both of Wuppertal-Elberfeld, and Wulf Vater, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

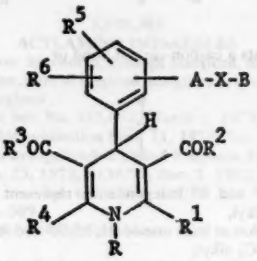
Division of Ser. No. 366,578, June 4, 1973. This application Aug. 28, 1974, Ser. No. 501,226

Claims priority, application Germany, July 24, 1973, 2228363

Int. Cl.² C07D *213/55*

U.S. Cl. 260—294.8 G 10 Claims

1. A compound of the formula:



wherein

R is hydrogen, lower alkyl or alkenyl of 2 to 4 carbon atoms;

each of R^1 and R^4 is hydrogen or alkyl of 1 to 3 carbon atoms;

each of R^2 and R^3 is lower alkyl; alkenyl of 2 to 4 carbon atoms; or a member selected from the group consisting of lower alkoxy, alkenyloxy of 2 to 4 carbon atoms and alkynyloxy of 2 to 4 carbon atoms which is unsubstituted, or substituted by hydroxy or lower alkoxy; or

R^2 and R^3 are each furfuryloxy; A is oxygen or sulphur; B is

wherein each of R^7 and R^8, when taken independently, is hydrogen or lower alkyl or, when taken together, are alkylene of 4 to 6 carbon atoms;

X is lower alkylene or hydroxy-(lower alkylene); each of R^5 and R^6 is hydrogen, lower alkyl, lower alkoxy, nitro, halogeno, cyano, amino, lower alkylamino, di-(lower alkyl)amino or acetylamino, but only one is cyano, lower alkylamino, di-(lower alkyl)amino or acetylamino,

or a nontoxic pharmaceutically acceptable acid addition salt thereof.

3,959,297

PROCESS FOR THE PREPARATION OF 3-CYANOPYRIDINE

Ryoji Ishioka, Tokyo; Norio Kametaka, Hiratsuka, and Kuniomi Marumo, Tokyo, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1975, Ser. No. 553,627

Claims priority, application Japan, Mar. 14, 1974, 49-28597; Jan. 13, 1975, 50-5559

Int. Cl.² C07D *213/57*

U.S. Cl. 260—294.9 19 Claims

1. A process for preparing 3-cyanopyridine by the ammoxidation of 2-methyl-5-ethylpyridine which comprises reacting 2-methyl-5-ethylpyridine with ammonia and oxygen at a temperature of 300° – 500°C. in the presence of a supported metal oxide catalyst and the copresence of steam, said catalyst being one obtained by depositing on a low-area carrier of specific surface area of 0.01 – 50 square meters per gram a combined two to four-component metal oxide selected from the group consisting of the vanadium-zirconium, vanadium-titanium-zirconium, vanadium-titanium-tungsten, vanadium-zirconium-tungsten and vanadium-titanium-zirconium-tungsten combined metal oxides, and calcining the metal oxide-deposited carrier at a temperature of 300 – 600°C. under a nonreducing atmosphere, said steam being used in an amount of 20 – 80 volume % based on the total volume of the feed gas to the reaction system.

3,959,298

PROCESS FOR PREPARING TRIACETONAMINE

Keisuke Murayama; Syoji Morimura; Takao Yoshioka, and Tomoyuki Kurumada, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed June 21, 1974, Ser. No. 481,838

Claims priority, application Japan, June 23, 1973, 48-70944; May 30, 1974, 49-61147

Int. Cl.² C07D *211/74*

U.S. Cl. 260—293.89 46 Claims

1. A Process for preparing triacetonamine comprising reacting acetonine with water in the presence of at least 12.5 mol-% based on acetonine of an acid catalyst selected from the group consisting of a mineral acid, a carboxylic acid, an organic sulfur-oxygen-, organic phosphorus-oxygen acid, salt of said acids with ammonia or a nitrogen-containing organic base, and mixture of said acid catalysts.

3,959,299

HERBICIDAL AMIDE DERIVATIVES

Eirlys R. Isaac, Sittingbourne, and Peter Kirby, Maidstone, both of England, assignors to Shell Oil Company, Houston, Tex.

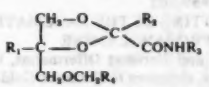
Division of Ser. No. 482,935, June 25, 1974, Pat. No. 3,920,675. This application Aug. 4, 1975, Ser. No. 601,746

Claims priority, application United Kingdom, July 3, 1973, 31604/73

Int. Cl.² C07D *405/12*

U.S. Cl. 260—295 AM 4 Claims

1. An amide derivative of the formula



wherein R_1 and R_2 each represents an alkyl group of 1 to 6 carbon atoms; R_3 represents pyridyl; and R_4 represents a phenyl group optionally substituted by one or two chlorine atoms or by an alkyl group of 1 to 6 carbon atoms.

3,959,300

NOVEL INDOLOBENZAZEPINE DERIVATIVES, USEFUL AS TRANQUILIZERS

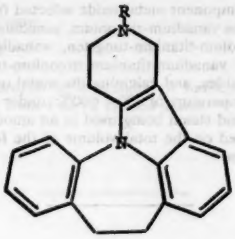
Michael Finizio, Howard Beach, N.Y., assignor to Endo Laboratories, Inc., Garden City, N.Y.

Division of Ser. No. 170,990, Aug. 11, 1971, Pat. No. 3,764,684, and a continuation-in-part of Ser. No. 389,197, Aug. 17, 1973, abandoned. This application June 14, 1974, Ser. No. 479,512

Int. Cl.² C07D *221/02*

U.S. Cl. 260—296 P 12 Claims

1. A compound selected from (A) a free base having the formula



in which R is $C_nH_{(2n-x)}Z_y$, wherein:
n is a positive integer of 3-12;
x is 1, 3, or 5;
y is 0 or 1; and
Z is oxygen or sulfur;
with the proviso that when *y* is 1, *n* is no larger than 6, and *x* is 1; and when *x* is 5, *n* is at least 7; and (B) an addition salt of (A) with a pharmaceutically acceptable acid.

3,959,301

ALGICIDOL 2-CHLORO-5-TOLYL-1,3,4-THIADIAZOLES

Norman A. Dahle, Mission, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 869,329, Oct. 24, 1969, Pat. No. 3,690,858. This application Dec. 13, 1971, Ser. No. 207,527
Int. Cl.² C07D *285/12*
U.S. Cl. 260—302 D **3 Claims**

1. 2-chloro-5-(o-tolyl)-1,3,4-thiadiazole.
2. 2-chloro-5-(m-tolyl)-1,3,4-thiadiazole.
3. 2-chloro-5-(p-tolyl)-1,3,4-thiadiazole.

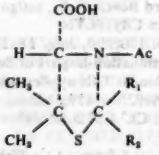
3,959,302

PROCESS FOR THE SPLITTING OF THE RACEMATE OF D-1-PHENYLPROPANOLAMINE

Friedrich Asinger, Aachen, and Heribert Offermanns, Grossauheim, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Continuation-in-part of Ser. No. 419,448, Nov. 27, 1973, abandoned, and a continuation-in-part of Ser. No. 276,236, July 28, 1972, abandoned. This application Oct. 10, 1974, Ser. No. 513,725
Claims priority, application Germany, July 30, 1971, 2138121; Nov. 29, 1972, 2258410
Int. Cl.² C07D *277/06*
U.S. Cl. 260—306.7 C **18 Claims**

1. An optically active salt of norephedrine with a thiazolidine-4-carboxylic acid of the formula:



where R_1 and R_2 are both methyl and Ac is formyl.

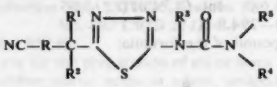
3,959,303

5-CYANOALKYL-1,3,4-THIADIAZOL-2-YLUREAS

Tony Cebalo, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 15, 1974, Ser. No. 514,671
Int. Cl.² C07D *285/12*
U.S. Cl. 260—306.8 D **7 Claims**

1. A compound of the formula



wherein
R represents a carbon-carbon bond or

R^1, R^2, R^6 and R^7 independently represent hydrogen or C_1–C_2 alkyl,
provided that at least one of R^1, R^2, R^6 and R^7 must represent C_1–C_2 alkyl;
R^3 and R^4 independently represent C_1–C_3 alkyl;
R^5 represents hydrogen, C_1–C_3 alkyl or C_1–C_3 alkoxy.

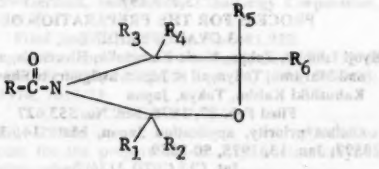
3,959,304

CERTAIN 3-HALOACYL-2,2,5-TRIMETHYL-OXAZOLIDINES

Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

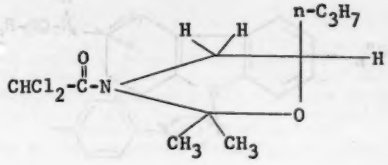
Continuation-in-part of Ser. No. 484,514, July 1, 1974, abandoned, which is a continuation of Ser. No. 356,548, May 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 297,582, Oct. 13, 1972, abandoned. This application Apr. 7, 1975, Ser. No. 566,019
Int. Cl.² C07D *263/04*
U.S. Cl. 260—307 FA **13 Claims**

1. A compound having the formula



in which R is selected from the group tribromomethyl, monochloromethyl, dichloromethyl, 1-bromoethyl, monobromomethyl, 1,2-dibromoethyl, 2-chloropropyl, 1-bromopropyl, 1-bromobutyl, 3-chloropropyl, 5-bromopentyl; R_1 is methyl; R_2 is methyl; R_5 is methyl; and R_3, R_4 and R_6 are each hydrogen.

13. The compound having the formula



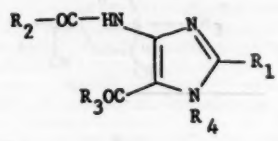
3,959,305

ACYLAMINO IMIDAZOLES

Anthony Trevor Ainsworth, Bishops Stortford, and Carl John Rose, London, both of England, assignors to Beecham Group Limited, England

Division of Ser. No. 337,062, March 1, 1973, Pat. No. 3,876,655. This application Sept. 11, 1974, Ser. No. 504,962
Claims priority, application United Kingdom, Feb. 24, 1972, 8604/72; Feb. 23, 1973, 9134/73; Dec. 1, 1972, 55506/72
Int. Cl.² C07D *233/92*
U.S. Cl. 260—309 **13 Claims**

1. A compound of the formula:



wherein

R_1 is ethyl, n-propyl, isopropyl, butyl, isopentyl, n-hexyl, cyclohexyl or cyclohexenyl;

R_2 is methyl or ethyl;

R_3 is amino or alkoxy of 2 to 5 carbon atoms; and

R_4 is hydrogen.

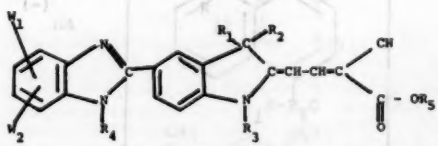
3,959,306

AZOLINDOLINES AND AZOLINDOLINE DYESTUFFS

Horst Harnisch, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 179,181, Sept. 9, 1971, Pat. No. 3,840,552. This application Feb. 28, 1974, Ser. No. 446,892
Claims priority, application Germany, Sept. 9, 1970, 2044620
Int. Cl.² C07D *487/04*
U.S. Cl. 260—309.2 **4 Claims**

1. Azolindoline dyestuff of the formula



wherein

W_1 is hydrogen, alkyl of 1–5 carbon atoms, cyclo-hexyl, phenyl, chloro, alkoxy of 1–5 carbon atoms, methyl-sulfonyl, ethylsulfonyl, dimethylaminosulfonyl, diethylaminosulfonyl, dimethylaminocarbonyl, diethylaminocarbonyl, methoxycarbonyl, ethoxycarbonyl, β-methoxyethoxycarbonyl, acetylamino, propionylamino, or methylsulfonylamino;

W_2 is hydrogen or alkyl of 1–5 carbon atoms;

W_1 and W_2 additionally can be joined together to produce a fused benzene ring;

R_1 and R_2 separately are methyl or ethyl, or can be joined together to produce a cyclopentyl or a cyclohexyl ring;

R_3 is alkyl of 1–5 carbon atoms, chloroethyl, bromo-ethyl, fluoroethyl, cyanoethyl, allyl, methoxycarbonylethyl, benzyl, or phenylethyl;

R_4 is alkyl of 1–5 carbon atoms, chloroethyl, hydroxy-ethyl, methoxyethyl, cyanoethyl, allyl, benzyl or phenylethyl; and

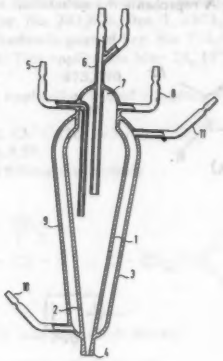
R_4 is hydrogen, alkyl of 1–5 carbon atoms, chloroethyl, bromoethyl, fluoroethyl, cyanoethyl, methoxyethyl, δ-hydroxy-butyl, acetonyl, allyl, methoxycarbonylethyl, benzyl, phenyl-ethyl, or cyclohexyl.

3,959,307

METHOD TO DETERMINE AUTOMATICALLY THE SEQUENCE OF AMINO ACIDS

Brigitte Wittmann, nee Liebold, Meisenstrasse 17, and Horst Graffunder, Lutzelsteiner Weg 52, both of 1000-Berlin 33, Germany

Filed Feb. 15, 1974, Ser. No. 442,852
Int. Cl.² C07D *49/32*
U.S. Cl. 260—309.5 **7 Claims**



1. In a method for automatically converting a thiazolinone amino acid into a phenylthiohydantoin amino acid in the process of amino acid sequence analysis of proteins or peptides by heating said thiazolinone amino acid for a short period of time in acidic solution and transferring such solution into an organic solvent to form a solution which is appropriate for identification or further purification, the improvement that comprises introducing, with the continuous exclusion of oxygen, by the means of an inert gas flow, a solution of a thiazolinone amino acid, immediately after its formation in a solvent appropriate for said conversion, into a reaction vessel where it is evaporated to dryness at a temperature between 50° and 80°C., adding, while maintaining said temperature, an aqueous trifluoro acetic or dilute hydrochloric acid solution containing an SH-group containing substance selected from the

group consisting of dithioerythrite, β-mercaptoethanol, ethane dithiol, butane dithiol or butane thiol, in an amount which, at said temperature and flow through of said inert gas, completely evaporates within 30 to 40 minutes, dissolving the residue from the evaporation stage by spraying over it a mixture of 6 to 8 parts of volume of 1,2-dichloroethane and 4 to 2 parts of volume of methanol, and removing the resultant solution from said reaction vessel.

3,959,308

SUBSTITUTED NAPHTHO PYRAZOLES

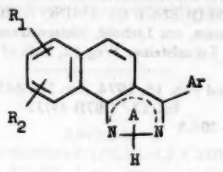
Robert V. Coombs, Chatham, and William J. Houlihan, Mountain Lakes, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 333,557, Feb. 20, 1973, Pat. No. 3,843,664. This application June 27, 1974, Ser. No. 483,625

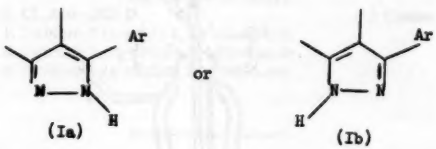
Int. Cl.² C07D *231/54*

U.S. Cl. 260—310 R **3 Claims**

1. A compound of the formula



where ring A represents the structures



Ar is

3,959,309

3-AMIDO-1,2,3,4-TETRAHYDROCARBAZOLES

Aram Mooradian, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 172,206, Aug. 16, 1971, abandoned, which is a continuation-in-part of Ser. No. 793,545, Jan. 23, 1969, abandoned, which is a continuation-in-part of Ser. No. 659,606, Aug. 10, 1967, Pat. No. 3,642,816. This application Dec. 17, 1973, Ser. No. 425,205

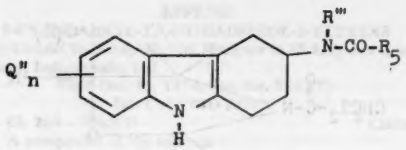
Claims priority, application Canada, Jan. 24, 1968, 10686

The portion of the term of this patent subsequent to Feb. 15, 1989, has been disclaimed.

Int. Cl.² C07D *209/88*

U.S. Cl. 260—315 **9 Claims**

1. A 3-(NR'''-CO-R_3)-1,2,3,4-tetrahydrocarbazole having the formula



where

R_3 is hydrogen, lower-alkyl or Ar;

R''' is hydrogen or lower-alkyl;

Q'' is fluoro;

n is an integer from 1 to 4; and

Ar is phenyl or phenyl substituted by from one to three of the same or different substituents selected from non-tertiary-lower-alkyl, non-adjacent tertiary-lower-alkyl, lower-alkoxy, non-adjacent trihalomethyl, non-adjacent nitro and halo;

where lower-alkyl and lower-alkoxy, every occurrence, have from one to six carbon atoms.

3,959,310

CATIONIC DYESTUFFS

Alfred Brack, Odenthal, and Ernst Schmitt, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

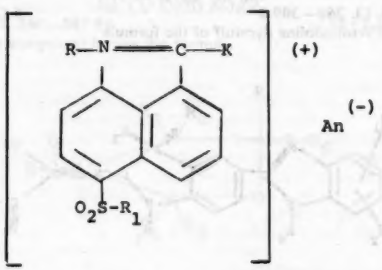
Filed Jan. 19, 1973, Ser. No. 324,925

Claims priority, application Germany, Jan. 19, 1972, 2202316

Int. Cl.² C07D *209/56*

U.S. Cl. 260—326.9 **9 Claims**

1. Cationic dyestuff of the formula

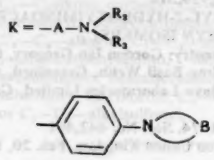


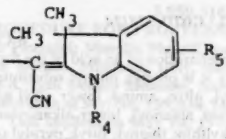
wherein

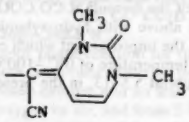
R is hydrogen, methyl, n-propyl, i-propyl, n-butyl, -cyanoethyl, or -hydroxyethyl;

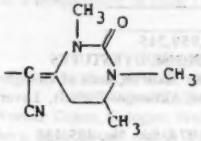
R_1 is methyl, n-butyl, allyl, phenyl, p-tolyl, o-tolyl, p-chlorophenyl, or m-nitrophenyl;

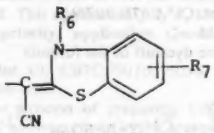
K is

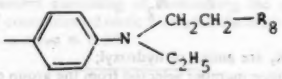


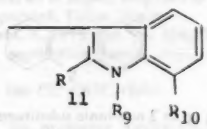


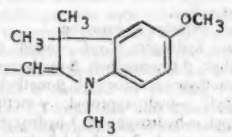












N-methyl-tetrahydroquinolinyl,
N-ethyl-tetrahydroquinolinyl,
N-β-chloroethyl-tetrahydroquinolinyl,
N-β-cyanoethyl-tetrahydroquinolinyl;

A is p-phenylene, 2,5-diethoxy-p-phenylene, 2,5-dimethoxy-p-phenylene 3-methyl-p-phenylene, 3-methoxy-p-phenylene, 3-chloro-p-phenylene, 3-methoxycarbonylamino-p-phenylene, 3-dimethylamido-carbonylamino-p-phenylene, 3-ethoxy-p-phenylene, or 3-methylamido-carbonylamino-p-phenylene;

R_3 is methyl, ethyl, n-propyl, n-butyl, i-butyl, β-chloroethyl, diethylaminoethyl, cyclohexyl, phenyl, p-othoxyphenyl, o-methoxyphenyl, o-tolyl, benzyl, or p-methylbenzyl;

R_3 is hyrogen, methyl, ethyl, n-propyl, or n-butyl;

R_4 is methyl or ethyl;

R_5 is hydrogen, 5-chloro, 5-methoxy, or 5-ethoxy;

R_6 is methyl, ethyl, or n-butyl;

R_7 is hydrogen or 6-methoxy;

R_8 is chloro, cyano, methoxy, methoxycarbonyl, β-ethoxyethyl, β-cyanoethyl, β-hydroxycarbonylethyl, dimethylamino, carbonamido, phenyl, piperidyl, pyrrolidinyl, or morpholinyl;

R_9 is hydrogen or methyl;

R_{10} is hydrogen or ethyl;

R_{11} is methyl or phenyl;

B is the remaining portion of morpholinyl, piperidinyl, pyrrolidinyl, 3-methylpyrazolinyl 3-phenylpyrazolinyl, or N-β-cyanoethylpiperazinyl; and

An $^{(-)}$ is an anion.

3,959,311

OXOTREMORINE ANTAGONISTS

Johan Richard Dahlbom, Sodertalje; Bo Lennart Karlen, Skarholmen, and Sune Gunnar Lindgren, Vallentuna, all of Sweden, assignors to Aktiebolaget Astra, Sodertalje, Sweden

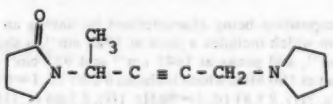
Continuation of Ser. No. 203,828, Dec. 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 774,530, Nov. 8, 1968, abandoned. This application May 24, 1974, Ser. No. 473,190

Claims priority, application United Kingdom, Nov. 9, 1967, 51146/67

Int. Cl.² C07D *295/12, 207/12*

U.S. Cl. 260—326.5 FL **2 Claims**

1. A compound having the formula



or a therapeutically acceptable salt thereof.

3,959,312

SYNTHESIS OF ANTITUMOR ALKALOID DEOXYHARRINGTONINE AND ITS PRECURSOR 3'-0-(5-METHYL-2-OXOHEXANOYL)-CEPHALOTAXINE

Kenneth L. Mikolajczak, Benson, and Cecil R. Smith, Jr., Dunlap, both of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Dec. 20, 1974, Ser. No. 534,925

Int. Cl.² C07D *491/14*

U.S. Cl. 260—326.29 **4 Claims**

2. A process for the preparation of deoxyharringtonine comprising the steps of:

a. reacting 1-lithio-3-methylbut-1-yne with a 150% to 165% excess of the stoichiometric amount of ethyl t-butyl oxalate in THF containing an amount of a suitable hydrocarbon solvent sufficient to solubilize said 1-lithio-3-methylbut-1-yne, the reaction being carried out under anhydrous conditions in an inert atmosphere at a temperature

of from 0° to 10° to form t-butyl 5-methyl-2-oxohex-3-ynoate;

b. hydrogenating t-butyl 5-methyl-2-oxohex-3-ynoate in the presence of a catalytic amount of a suitable catalyst to form t-butyl 5-methyl-2-oxohexanoate;

c. hydrolyzing t-butyl 5-methyl-2-oxohexanoate under mild conditions to form 5-methyl-2-oxohexanoic acid;

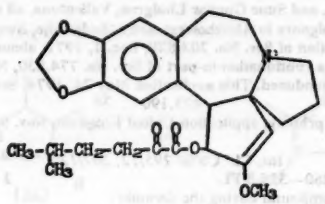
d. reacting 5-methyl-2-oxohexanoic acid with at least a 10% excess of the stoichiometric amount of oxalyl chloride under anhydrous conditions at a temperature of 25° to 60° C. for from 40 to 60 hours to form 5-methyl-2-oxohexanoyl chloride;

e. reacting cephalotaxine with a 50% to 200% excess of the stoichiometric amount of 5-methyl-2-oxohexanoyl chloride in a suitable solvent at about 25° to 30° C. for a minimum of 24 hours in the presence of a molar amount of pyridine equivalent to the initial amount of 5-methyl-2-oxohexanoyl chloride to form 3'-O-(5-methyl-2-oxohexanoyl)-cephalotaxine;

f. reacting 3'-O-(5-methyl-2-oxohexanoyl)-cephalotaxine contained in the reaction mixture resulting from step (e) with lithio methyl acetate in amounts such that the molar ratio of 3'-O-(5-methyl-2-oxohexanoyl)-cephalotaxine to lithio methyl acetate is 1:2, the reaction being carried out in THF under anhydrous conditions in an inert atmosphere at about −78° C. to form a mixture of deoxyharringtonine and a deoxyharringtonine diastereomer; and

g. separating deoxyharringtonine from the mixture resulting from step (f).

4. The composition 3'-O-(5-methyl-2-oxohexanoyl)-cephalotaxine having the following general structure:



said composition being characterized by having an infrared spectrum which includes a peak at 1725 cm^{-1}, a shoulder at 1730 cm^{-1}, and peaks at 1645 cm^{-1} and 935 cm^{-1}; an nmr spectrum at 100 MHz which includes δ 0.81 (d, J = 6 Hz, 6H), δ 3.68 (s, 3H), δ 3.81 (d, J = 10 Hz, 1H), δ 5.08 (s, 1H), δ 5.82 (s, 2H), δ 5.86 (d, J = 10 Hz, 1H), and δ 6.56 and δ 6.58 (2s, 1H each); and high-resolution mass spectrum which shows that $M^+ = 441.215$.

3,959,313

PREPARATION OF DITHIOLIUM COMPOUNDS

Bernardus A. Oude Alink, St. Louis, and Derek Redmore, Ballwin, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed May 20, 1974, Ser. No. 471,285

Int. Cl.² C07D *339/04*

U.S. Cl. 260—327 C **5 Claims**

1. A process of oxidizing a sterically hindered 1,2-dithiole-3-thione containing branched aliphatic groups in the 4 and 5 positions to the corresponding 1,2-dithiolium hydrogen sulfate which comprises reacting said sterically hindered 1,2-dithiole-3-thione with nitric acid at a temperature between about 40°C. to about 86°C.

3,959,314

PREPARATION OF 2-ARYL-2-HYDROXYIMINOACETIC ACIDS (SYN ISOMERS)

Victor Malcolm Clark, Coventry; Gordon Ian Gregory, Chalfont St. Peter, and Godfrey Basil Webb, Greenford, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Filed Feb. 14, 1974, Ser. No. 442,401

Claims priority, application United Kingdom, Feb. 20, 1973, 8382/73

Int. Cl.² C07D *333/24*

U.S. Cl. 260—332.2 A **8 Claims**

1. In a process for the preparation of an acid of the formula R.C(:NOH).COOH where R is phenyl; phenyl substituted by halo, hydroxy, lower alkyl, nitro, amino, lower alkyl amino, di(lower alkyl)amino, lower alkanoyl, lower alkanoylamido, lower alkoxy or lower alkylthio; thienyl; furyl; pyridyl or oxazolyl by reacting an acid of the formula R.CO.COOH where R has the meaning given above with hydroxylamine in an aqueous reaction medium, the improvement which comprises effecting the reaction at a temperature of 0°C.–100°C. and at a pH within the range of about 5.5–13, in the presence of a source of magnesium ions.

3,959,315

ANTHRAQUINONE DYESTUFFS

Volker Hederich, and Gunter Gehrke, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

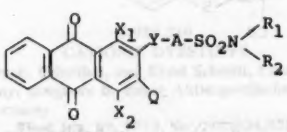
Filed Apr. 29, 1974, Ser. No. 465,433

Claims priority, application Germany, Apr. 27, 1973, 2321331

Int. Cl.² C07D *307/91*

U.S. Cl. 260—346.2 M **6 Claims**

1. An anthraquinone dyestuff of the formula

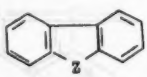


in which

X_1 and X_2 are amino or hydroxyl;

Y is a bridge member selected from the group consisting of —O—, —S—, —O—alkylene—O—, —O—alkylene—S—, —O—alkylene—NH—, in which alkylene is a C_1—C_4— hydrocarbon or C_1—C_4—hydrocarbon interrupted by 0;

A is the radical



containing up to 2 non-ionic substituents selected from the group consisting of halogen; C_1—C_4—alkyl; C_1—C_4—alkyl substituted by hydroxyl, —CN or C_1—C_4—alkoxy; and C_1—C_4—alkoxy;

Z is —O— or —S—;

Q is hydrogen, chlorine or bromine;

R_1 and R_2 are hydrogen; C_1—C_4—alkyl; β-hydroxyethyl; β-chloroethyl; β-bromoethyl; β-methoxyethyl; β-ethoxyethyl; β-methylmercaptoethyl; β-methylsulphonylethyl; β-cyanoethyl; γ-hydroxypropyl; γ-methoxypropyl; γ-ethoxypropyl; ω-hydroxybutyl; 3-hydroxybutyl; 2-methyl-1,3-dihydroxypropyl; 2-methyl-1-hydroxypropyl; β-[β'-hydroxyethoxy) ethyl; benzyl; methyl-benzyl; cyclohexyl; methyl-cyclohexyl; phenyl; or phenyl mono-substituted or di-substituted by a member selected from the group

consisting of halogen, nitro, trifluoromethyl, hydroxy, C_1—C_4alkoxy, carboxyl, C_1—C_4—alkylcabamoyl, phenylcarbamoyl, phenylcarbamoyl substituted by chlorine, C_1—C_4—alkyl or C_1—C_4—alkoxy, formylamino, C_2—C_5—alkylcarbonylamino, benzoylamino, C_1—C_4—alkanesulfamide, benzenesulfamoyl and benzenesulfamoyl substituted by chlorine, C_1—C_4—alkyl, C_1—C_4—alkoxy, or C_1—C_4—alkylsulfonyl.

3,959,316

PROCEDURE FOR PROPYLENE OXIDE SYNTHESIS

Carlo Piccinini; Morello Morelli, and Pierluigi Rebora, all of San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

Continuation of Ser. No. 339,938, March 9, 1973, abandoned. This application May 14, 1974, Ser. No. 469,895

Claims priority, application Italy, May 13, 1972, 21767/72

Int. Cl.² C07D *301/10*

U.S. Cl. 260—348.5 R **3 Claims**

1. A vapor phase reaction for the production of propylene oxide which comprises oxidizing propylene in the presence of a silver based catalyst and an atmosphere that consists essentially of oxygen or air, and from 2 to 25% by volume of water vapor at a temperature of from 110° to 400°C.

3,959,317

PROCESS FOR THE PREPARATION OF 1-NITROANTHRAQUINONE

Karl-Werner Thiem, Cologne; Wolfgang Auge, Odenthal-Hahnenberg, and Rütger Neeff, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 432,452, Jan. 11, 1974, abandoned. This application July 9, 1975, Ser. No. 594,254

Claims priority, application Germany, Jan. 13, 1973, 2301735

Int. Cl.² C07C *79/10*, *79/36*; C09B *1/00*

U.S. Cl. 260—369 **5 Claims**

1. In the process of preparing 1-nitroanthraquinone by nitration of anthraquinone in the presence of nitric acid of at least 90% strength wherein the nitration is carried out at temperatures of 20° to 80°C and the reaction is terminated by lowering the nitric acid molar fraction in the reaction mixture, the improvement consisting of terminating the reaction by distilling off concentrated nitric acid until the nitric acid molar fraction has a value ≤ 0.85.

3,959,318

PROCESS FOR PREPARING HIGHLY PURE 5-NITRO-1,4,4A,9A-TETRAHYDROANTHRAQUINONE

Yasuyoshi Torisu, Yanagawa; Seishichiro Kaba, Arao, and Ken Mukai, Omuta, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Sept. 5, 1975, Ser. No. 610,778

Claims priority, application Japan, Sept. 6, 1974, 49-101914

Int. Cl.² C07C *49/68*

U.S. Cl. 260—369 **13 Claims**

1. In a process for preparing 5-nitro-1,4,4a,9a-tetrahydroanthraquinone by the reaction of 5-nitro-1,4-naphthoquinone with 1,3-butadiene in a solvent, the improvement comprising cooling either a solution which is obtained by reacting 5-nitro-1,4-naphthoquinone with 1,3-butadiene in a solvent selected from the group consisting of benzene, an alkylated aromatic hydrocarbon, a halogenated aromatic hydrocarbon, a halogenated aliphatic hydrocarbon and a mixture thereof or a solution which is obtained by reacting 5-nitro-1,4-naphthoquinone with 1,3-butadiene and dissolving the resulting product under heating conditions in the above-defined solvent to crystallize 5-nitro-1,4,4a,9a-tetrahydroanthraquinone, and separating the crystallized 5-nitro-1,4,4a,9a-tetrahydroanthraquinone by filtration.

3,959,319

KETO AND ALKOXY ESTERS OF $PGF_2\alpha$ TYPE PROSTAGLANDINS

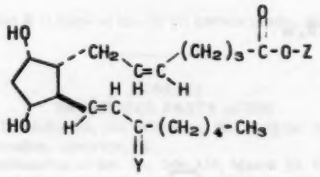
Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 431,758, Jan. 8, 1974. This application Sept. 30, 1974, Ser. No. 510,551

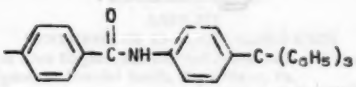
Int. Cl.² C07C *69/74*, *103/26*

U.S. Cl. 260—390 **11 Claims**

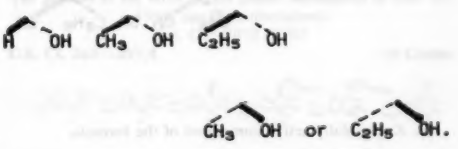
1. An optically active compound of the formula



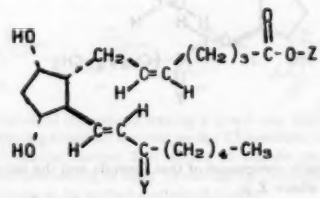
or a racemic compound of that formula and the mirror image thereof, where Z is



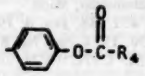
and where Y is



7. An optically active compound of the formula

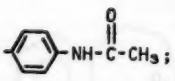


or a racemic compound of that formula and the mirror image thereof, wherein Z is

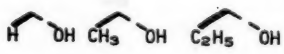


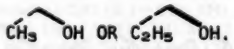
wherein R_4 is

or

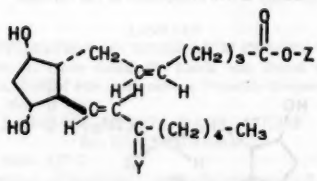


and wherein Y is

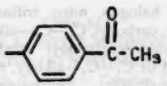




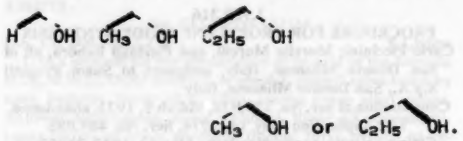
10. An optically active compound of the formula



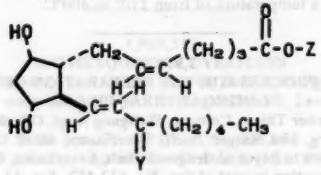
or a racemic compound of that formula and the mirror image thereof, where Z is



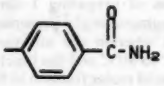
and where Y is



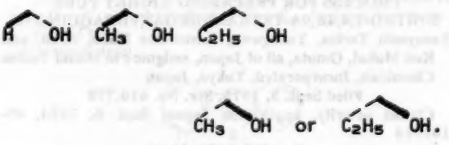
11. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, where Z is



and where Y is



3,959,320

PROCESS AND COMPOUNDS

William G. Salmond, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 23, 1974, Ser. No. 508,640

Int. Cl.[2] C07J 9/00

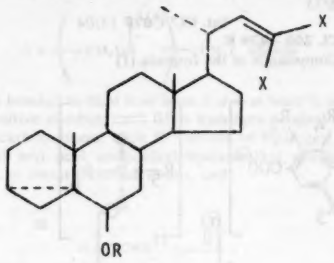
U.S. Cl. 260—397.2 **19 Claims**

1. A method for preparing 3α,5α-cyclo-6β-alkoxy 25-hydroxycholesterol wherein alkoxy is from one to six carbon atoms, inclusive, which comprises

a. reacting 3α,5α-cyclo-6β-alkoxybisnorcholanaldehyde, alkoxy of one to six carbon atoms, inclusive, with

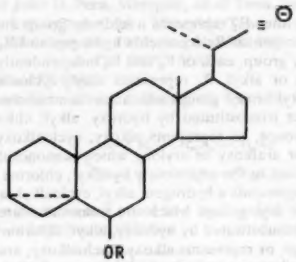
1. the phosphorane, $(C_6H_5)_3P{=}CBr_2$ or
2. the hexamethylphosphorous triamide derivative $(Me_2N)_3P{=}CCl_2$

to form the 3α,5α-cyclo-6β-alkoxy-20S-(2',2'-dihalovinyl)-pregnane



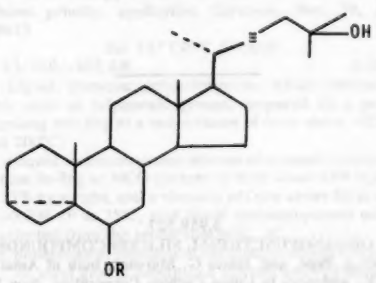
wherein R is alkyl of one to six carbon atoms, inclusive, and X is bromo or chloro;

b. reacting the said dihalovinyl pregnane with an organolithium compound wherein organo is selected from the group consisting of alkyl of one to four carbon atoms, inclusive, and phenyl in an inert organic solvent at a reduced temperature to produce the acetylene anion



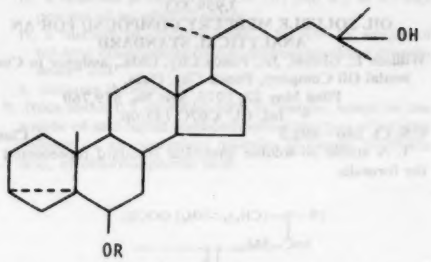
wherein R is as defined above

c. reacting the said acetylene anion with 2-methyl-propan-1,2-oxide at an elevated temperature and in an inert organic solvent to form the acetylenic alcohol



wherein R is as above defined

d. saturating the triple bond of the said acetylenic alcohol to form 3α,5α-cyclo-6β-alkoxy-25-hydroxycholesterol



wherein R is alkyl of one to six carbon atoms, inclusive.

3,959,321

STABILIZED FATTY ACIDS

Arthur L. McKenna, III, Wheeling, Ill., assignor to Kraftco Corporation, Glenview, Ill.

Continuation of Ser. No. 346,336, March 30, 1973, abandoned. This application May 13, 1974, Ser. No. 469,440

Int. Cl.² C11B *5/00*

U.S. Cl. 260—398.5 **24 Claims**

1. A method for stabilizing fatty acids against oxidation comprising adding to fatty acids having a chain length of C_8 to C_{24} an effective amount of a stabilizer, said stabilizer being an alkali metal salt of an organic phosphate ester, said ester being the condensation reaction product of an alcohol and a phosphorus compound, said phosphorus being in the pentavalent state during said condensation reaction, said alcohol being selected from the group consisting of poly-alkylene alcohols and hydrocarbyl polyols.

3,959,322

SYNTHESIS OF 13-ALKYL-GON-4-ENES

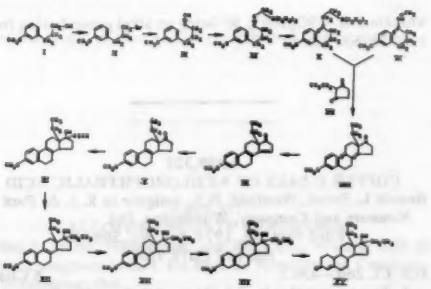
Gordon Alan Hughes, and Herchel Smith, both of Wayne, Pa., assignors to Herchel Smith, Bryn Mawr, Pa.

Continuation-in-part of Ser. No. 337,823, Jan. 15, 1964, which is a continuation-in-part of Ser. No. 228,384, Oct. 4, 1962, Pat. No. 3,850,911, which is a continuation-in-part of Ser. Nos. 57,904, Sept. 23, 1960, abandoned, and Ser. No. 91,341, Feb. 24, 1961, abandoned, and Ser. No. 137,535, Sept. 12, 1961, abandoned, and Ser. No. 195,000, May 15, 1962, abandoned, and Ser. No. 196,557, May 16, 1962, abandoned. This application Aug. 11, 1964, Ser. No. 388,820

The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.

Int. Cl.³ C07J *71/00*

U.S. Cl. 260—397.4 **48 Claims**



1. A chemical compound having a gon-4-ene nucleus, said nucleus having attached thereto, in the 13-position, a polycarbon-alkyl radical having 2 to about 16 carbon atoms; said compound containing at least 19 and up to a maximum of 40 carbon atoms in its carbon-carbon skeleton.

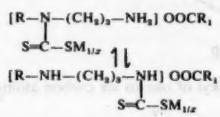
3,959,323

OIL SOLUBLE MERCURY COMPOUND FOR AN ANALYTICAL STANDARD

William L. Groves, Jr., Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed May 22, 1975, Ser. No. 579,760
Int. Cl.² C07C 155/06
U.S. Cl. 260—402.5 6 Claims

1. A stable oil-soluble analytical standard represented by the formula:



wherein M is a metal selected from the group consisting of mercury, vanadium, iron, lead, barium, berylium, tin, silver, titanium, copper, magnesium and sodium; R and R_1 are alkyl radicals containing from about 10 to 18 carbon atoms or mixtures thereof; and, x is an integer equal to the chemical valance of M.

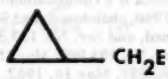
3,959,324

ALKYLTIN CYCLOPROPYLCARBINYLSULFONATE

Donald John Peterson, Cincinnati, and Medford Dwight Robbins, Fairfield, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 247,641, April 26, 1972, abandoned. This application Aug. 20, 1973, Ser. No. 390,156
Int. Cl.² C07F 7/22
U.S. Cl. 260—429.7 2 Claims

1. A compound of the formula



wherein E is $-SO_2SnR^1_3$, R^1 being an alkyl group having from 1–20 carbon atoms.

3,959,325

COPPER II SALT OF 4-CHLOROPHTHALIC ACID

Ronald L. Sweet, Westfield, N.J., assignor to E. I. du Pont De Nemours and Company, Wilmington, Del.

Filed Sept. 23, 1974, Ser. No. 508,653
Int. Cl.² C07F 1/08
U.S. Cl. 260—438.1 5 Claims

1. The copper II salt of 4-chlorophthalic acid.

2. Process for the preparation of the copper II salt of 4-chlorophthalic acid by reacting in aqueous medium at a pH from 3.3 to 4.3 at least one compound selected from the group consisting of 4-chlorophthalic acid and a monoalkali metal salt of 4-chlorophthalic acid with a source of copper II ion.

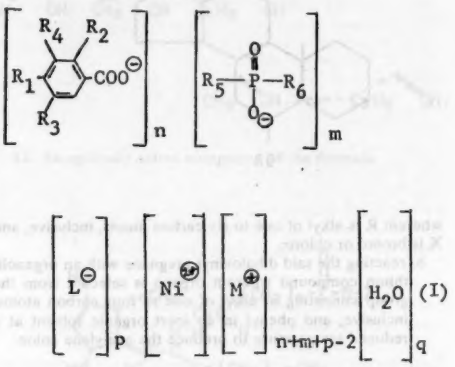
3,959,326

NICKEL STABILIZERS FOR SYNTHETIC POLYMERS

Paul Moser, Riehen, and Jean Rody, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 18, 1974, Ser. No. 524,685
Claims priority, application Switzerland, Nov. 27, 1973, 16632/73
Int. Cl.² C07F 15/04
U.S. Cl. 260—439 R 4 Claims

1. Compounds of the formula (I)



wherein either R_1 represents a hydroxy group and R_2 represents hydrogen or R_1 represents hydrogen and R_2 represents a hydroxy group, each of R_3 and R_4 independently represents hydrogen or alkyl, R_5 represents alkyl, cycloalkyl, aralkyl, aryl, aralkyl or aryl groups which are monosubstituted, disubstituted or trisubstituted by hydroxy, alkyl, chlorine and/or alkoxy groups, or represents alkoxy, cycloalkoxy, aralkoxy, aryloxy or aralkoxy or aryloxy which is monosubstituted or disubstituted in the aryl moiety by alkyl, chlorine and/or alkoxy, R_6 represents a hydrogen, alkyl, cycloalkyl, aralkyl, aryl, aralkyl or aryl groups which are monosubstituted, disubstituted or trisubstituted by hydroxy, alkyl, chlorine and/or alkoxy groups, or represents alkoxy, cycloalkoxy, aralkoxy, aryloxy or aralkoxy or aryloxy which is monosubstituted or disubstituted in the aryl moiety by alkyl, chlorine and/or alkoxy groups, L is the monovalent anion of an aliphatic carboxylic acid, M^+ is an alkali metal ion, n and m are 1 to 2, p is 0, or 1 to 2, and q is 0 to 2.

3,959,327

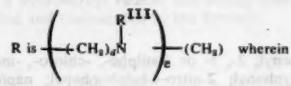
ORGANOFUNCTIONAL SILICON COMPOUNDS

Enrico J. Pepe, and James G. Marsden, both of Amalwalk, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

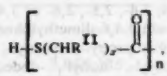
Filed June 2, 1971, Ser. No. 149,324
Int. Cl. C07f 7/18
U.S. Cl. 260—448.8 R 5 Claims

1. The silicon compounds having the average formula:

wherein x is about 2 to about 8; n is at least 1; b is 0, 1, 2 or 3; c is one or more of 0, 1, 2 and 3; p is equal to 3-b,



$(CH_2)_a$ is bonded to Si; a is at least 3; d is at least 2; and e is 0 or a positive number; each R^{II} is hydrogen or alkyl of 1 to about 4 carbon atoms; each R^{III} is one of hydrogen, alkyl, cycloalkyl, aryl, acyl, aminoalkyl, hydroxyalkyl, which alkyls contain 1 to about 8 carbon atoms, and



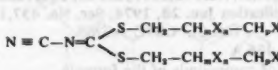
L is alkyl of 1 to about 6 carbon atoms; R^{VII} is hydrogen, alkyl of 1 to about 4 carbon atoms or phenyl; R^{V} is silicon bonded and is a hydrolyzable or condensable group.

3,959,328
HALOGENATED PROPYL ESTERS OF CYANODITHIOIMIDOCARBONIC ACID

Stanley J. Buckman, Memphis; Joseph G. E. Fenyes, Germantown, and John D. Pera, Memphis, all of Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

Filed Apr. 14, 1975, Ser. No. 568,069
Int. Cl.² C07C *119/06*
U.S. Cl. 260—453 RW **6 Claims**

1. A composition of matter having the formula:



wherein n is the same and equal to 1 or 2, m is 0 or 1, p is 1 or 2, and X is bromine or chlorine.

3,959,329
POLYISOCYANATES CONTAINING SULPHONIC ACID OR SULPHONATE GROUPS

Dieter Dieterich, Leverkusen; Peter Markusch, and Werner Dietrich, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 363,436, May 24, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 528,319
Claims priority, application Germany, Nov. 30, 1973, 2359615
Int. Cl.² C07C *119/048*
U.S. Cl. 260—453 AR **4 Claims**

1. Liquid aromatic polyisocyanates, which contain sulphonic acid or sulphonate groups, prepared by a process comprising reacting at a temperature of from about −20°C to about 200°C:

A. a liquid multicomponent mixture of aromatic polyisocyanate having an NCO content of from about 18% to about 35% by weight, and a viscosity of from about 50 to about 10,000 cP at 25°C, said liquid multicomponent mixture selected from the group consisting of:

i. phosgenation products of the condensates of (a) aniline or alkyl groups substituted anilines and (b) aldehydes or ketones;

ii. distillation residues obtained from the distillation of crude tolylene diisocyanate mixtures and which residues contain less than about 50% by weight of free tolylene diisocyanate isomers;

iii. a reaction product of (i) or (ii) and 0.2 to 25 mol percent of an organic polyol;

iv. a mixture of (i) with from 1 to 30% by weight of tolylene diisocyanate or 2,4′-diphenylmethane diisocyanate; and

v. mixtures thereof; and

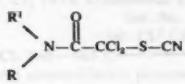
B. from about 0.1 to about 10% by weight, based on the weight of said liquid multicomponent mixture of sulphur trioxide or an equivalent quantity of oleum, sulphuric acid, or chlorosulphonic acid.

3,959,330
SUBSTITUTED DICHLOROMETHYL THIOCYANATES AND THEIR MANUFACTURE

Wendell Gary Phillips, Olivette, and Kenneth Wayne Ratts, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

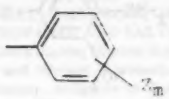
Filed Nov. 8, 1971, Ser. No. 196,739
Int. Cl.² C07C *161/02*
U.S. Cl. 260—454 **7 Claims**

1. A compound of the formula



wherein R is lower alkyl, lower alkoxyalkyl, lower alkoxy, phenyl or substituted phenyl of the formula

wherein Z is halo, trihalomethyl, cyano, nitro, lower alkyl or lower alkoxy, and m is an integer from 1 through 3 inclusive, provided that when Z is nitro, m cannot exceed 2 and R^1 is phenyl or substituted phenyl of the formula



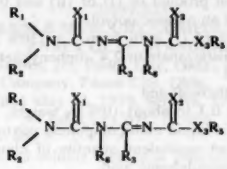
wherein Z and m have the aforementioned significance.

3,959,331
ALLOPHANIMIDATE HERBICIDES

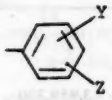
Julius J. Fuchs, Wilmington, and Kang Lin, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 181,201, Sept. 16, 1971, abandoned. This application Jan. 22, 1973, Ser. No. 325,357
Int. Cl.² C07C *157/14*
U.S. Cl. 260—455 A **3 Claims**

1. A compound of the formula



wherein
R_1 is hydrogen;
R_2 is



where
Y is hydrogen, halogen, or methyl; and
Z is halogen;
R_3 is OR_4 or SR_4;
R_4 is methyl or ethyl;
R_5 is methyl or ethyl;
R_6 is hydrogen;
X_1 and X_2 are oxygen; and
X_3 is oxygen or sulfur.

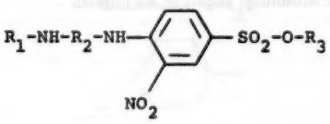
3,959,332

WATER SOLUBLE NITRO COMPOUNDS

Daniel Van Assche, Binningen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

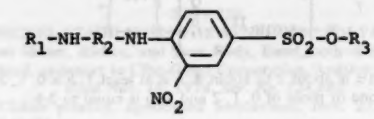
Filed Apr. 6, 1971, Ser. No. 131,826
Claims priority, application Switzerland, May 4, 1970, 6647/70
Int. Cl.² C07C *143/55*, *143/68*
U.S. Cl. 260—456 A **16 Claims**

1. A water-soluble nitro compound of the formula



wherein
R_1 and R_3, independently, are substituted or unsubstituted and are phenyl or naphthyl;
R_2 is substituted or unsubstituted and is phenylene or naphthylene;
any substituent on R_1 or R_2 is alkyl of 1 to 5 carbon atoms, alkoxy of 1 or 2 carbon atoms, chloro, fluoro, bromo, nitro, cyano, trifluoromethyl, sulpho, phenoxy or chlorophenoxy;
and any substituent on R_3 is alkyl of 1 to 12 carbon atoms, alkoxy of 1 to 5 carbon atoms, fluoro, chloro, bromo, phenoxy, benzyloxy, cyclohexyloxy, phenyl, cyclohexyl, 2,3-tetramethylene, 3,4-tetramethylene, carboxy, sulpho, nitro, or cyano;
provided that R_1 and R_3 may contain up to two substituents and R_3 may contain up to three substituents selected from chloro and bromo or otherwise up to two substituents, said compound containing one or two sulpho groups, at least one of which is attached to the group R_1 or R_2.

16. A compound of the formula



wherein
R_1 is phenyl; 2-, 3- or 4-sulpho-, -chloro-, -methoxy- or -ethoxyphenyl; 2-nitro-4-sulphophenyl; naphthyl-1; 4-phenoxyphenyl or 4-(4′-chlorophenoxy)-phenyl,
R_2 is phenylene; 2- or 3-sulphophenylene; 2-methoxyphenylene or 2-ethoxyphenylene, and
R_3 is phenyl; 2-, 3- or 4-methyl-, -ethyl-, -methoxy-, -ethoxy-, -bromo-, -chloro- or -fluorophenyl; 2,4- or 2,5-dichlorophenyl; 2,4,5- or 2,4,6-trichloro-, -tribromo or trimethylphenyl; 2,4-, 2,5-, 2,6- or 3,4-dimethyl- or -diethylphenyl; 2-ethyl-4,6-dimethylphenyl; 2,4-diethyl-6-methylphenyl; 4-isopropyl-, -n-butyl-, -t-butyl-, -t-amyl-, -t-octyl-, -iso-octyl-, -nonyl-, -dodecyl-, -butoxy-, -n-amyloxy-, -phenoxy-, -benzyloxy-, cyclohexyloxy-, -phenyl- or cyclohexylphenyl; 2,3- or 3,4-tetramethylenephenyl; 2-isopropyl-5-methylphenyl; 2-methyl-5-isopropylphenyl; 2-, 3- or 4-carboxyphenyl; 2-, 3- or 4-sulphophenyl; 3- or 4-nitro- or -cyanophenyl; naphthyl-1 or -2; 4-, 5-, 6- or 7-sulphonaphthyl; or 4 or 6-sulphonaphthyl-2.

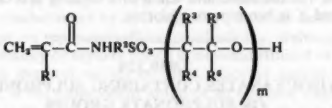
3,959,333

POLYMERIZABLE HYDROXY-CONTAINING ESTERS OF AMIDO-SUBSTITUTED SULFONIC ACIDS

Richard William Jahnke, Mentor-on-the-Lake, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Continuation of Ser. No. 375,257, June 29, 1973, abandoned. This application Jan. 28, 1974, Ser. No. 437,126
Int. Cl.² C07C *143/68*
U.S. Cl. 260—456 A **4 Claims**

1. Mixtures of compounds of the formula



wherein:
R^1 is hydrogen, halogen or a lower alkyl radical;
R^2 is divalent hydrocarbon radical having no more than about 30 carbon atoms;
each of R^3, R^4, R^5 and R^6 is hydrogen or a lower hydrocarbon radical, at least one of R^3, R^4, R^5 and R^6 being hydrogen; and
m is an integer from 1 to 10 ;
with the provisos that said hydrocarbon radicals are free from ethylenic and acetylenic unsaturation and that said mixtures contain compounds differing in the values of m.

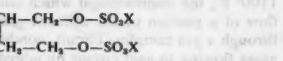
3,959,334

LIME SOAP DISPERSANT COMPOUNDS

Gar Lok Woo, Tiburon, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 790,470, Jan. 10, 1969, abandoned. This application July 31, 1972, Ser. No. 276,637
Int. Cl.² C07C *141/08*, *141/10*
U.S. Cl. 260—459 R **4 Claims**

1. The compounds of the formula:



wherein X is hydrogen or a water-soluble, salt-forming cation and R_1 is a hydrocarbyl radical containing from 14 to 36 carbon atoms and represented by the formula:

wherein R_2 and R_3 are hydrogen, alkyl or alkenyl radicals containing from 0 – 35 carbon atoms.

3,959,335

PROCESS FOR THE PREPARATION OF A BISPHENOL BISCHLOROCARBONIC ACID ESTER

Hugo Vernaleken; Kurt Weirauch; Gunther Lenz, all of Krefeld, and Uwe Hucks, Duisburg, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

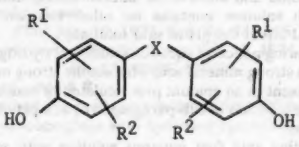
Filed Mar. 4, 1975, Ser. No. 555,149

Claims priority, application Germany, Mar. 6, 1974, 2410743

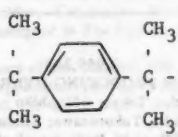
Int. Cl.² C07C *68/00, 69/96*

U.S. Cl. 260—463 6 Claims

1. A process for the continuous production of bisphenol bischlorocarbonic acid esters which comprises feeding a reaction mixture containing an aqueous dialkali metal salt solution of a hydroquinone or of an aromatic dihydroxy compound of the formula



wherein X is alkylene or alkylidene having 1 to 6 carbon atoms, cycloalkylene or cycloalkylidene having 5 to 15 carbon atoms, O, S, SO_2 or



and R^1 and R^2, which may be the same or different, are alkyl having 1 to 4 carbon atoms, chlorine or bromine and containing 2.5–5.0 mol per mol of dihydroxy compound of phosgene dissolved in a water immiscible solvent for the bischlorocarbonic ester product into a pump circulation reactor including a delivery pump on the upstream side of the delivery pump, delaying an interval of at least 1 second after commencing said feeding and then introducing into said reaction mixture, as the sole acid neutralizing agent for acid byproduct, an alkali metal hydroxide solution at a rate to maintain the pH value of the reaction mixture between 9.0 and 12.0, maintaining the reaction mixture in said pump circulation reactor for a dwell time of up to 12 minutes and at a Reynolds number greater than 2,000, separating the organic phase from the resulting reaction mixture and recovering bisphenol bischlorocarbonic acid ester therefrom by distillation, crystallization or a combination thereof.

3,959,336

AMMOXIDATION PROCESS

Ronald D. Bushick, Glen Mills, and Howard P. Angstadt, Media, both of Pa., assignors to Sun Ventures, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 404,964, Oct. 10, 1973, abandoned, and a continuation-in-part of Ser. No. 504,939, Sept. 11, 1974, abandoned. This application Apr. 15, 1975, Ser. No. 568,356

Int. Cl.² C07C *120/14*

U.S. Cl. 260—465 C 16 Claims

1. In the ammoxidation process of m- or p-xylene to the corresponding nitriles, which process is carried out by reacting said xylene with ammonia and oxygen at about 375°C. to about 500°C., the improvement of using as catalyst an alkali metal vanadium bronze supported on α-alumina and promoted with about 0.25% to about 10% by weight of Nb_2O_5.

3,959,337

AMMOXIDATION PROCESS

Ronald D. Bushick, Glen Mills, and Howard P. Angstadt, Media, both of Pa., assignors to Sun Ventures, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 404,965, Oct. 10, 1973, abandoned, and a continuation-in-part of Ser. No. 504,938, Sept. 11, 1974, abandoned. This application Apr. 15, 1975, Ser. No. 568,360

Int. Cl.² C07C *120/14*

U.S. Cl. 260—465 C 16 Claims

1. An ammoxidation process for preparing nitriles from m- and p-xylene which comprises reacting said xylene and ammonia at a temperature of from about 375°C. to about 500°C. and in the presence of added oxygen, the molar ratio of ammonia to xylene being no more than about 3:1, the molar ratio of oxygen to xylene being no more than about 3:1, the volume percent concentration of the reactant feed being about 3% to 10% xylene, 7% to 25% ammonia, and 10% to 20% oxygen, and the catalyst for said reaction comprising at least about 1 to 10% by weight of an alkali metal vanadium bronze supported on α-alumina.

3,959,338

1-(CYANO-PHENOXY)-2-HYDROXY-3-HYDROXYALKYLAMINO-PROPANES AND SALTS THEREOF

Herbert Koppe; Helmut Stahle; Werner Kummer, all of Ingelheim am Rhein, and Werner Traunecker, Munster-Sarmsheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein

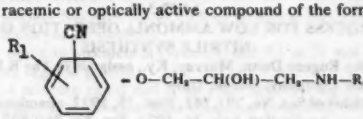
Continuation-in-part of Ser. No. 185,897, Oct. 1, 1971, abandoned. This application Mar. 18, 1974, Ser. No. 451,820

Claims priority, application Germany, Oct. 5, 1970, 2048838

Int. Cl.² C07C *121/80*

U.S. Cl. 260—465 E 5 Claims

1. A racemic or optically active compound of the formula



wherein

R_1 is hydrogen, chlorine, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms, and

R_2 is straight or branched monohydroxyalkyl of 3 to 4 carbon atoms,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,959,339
PROCESS FOR PRODUCING AROMATIC NITRILES

Masao Saito; Mamoru Onozawa, and Takamasa Kawakami, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed June 4, 1974, Ser. No. 476,270
Claims priority, application Japan, June 5, 1973, 48-63599
Int. Cl.² C07C *120/14*
U.S. Cl. 260—465 C 8 Claims

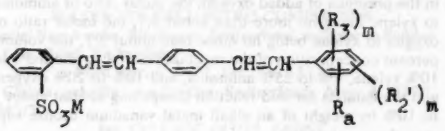
1. A process for producing aromatic nitriles by ammoxidation, which comprises passing a gas mixture comprising alkyl-substituted aromatic compound, ammonia and molecular oxygen over a catalyst comprising vanadium oxide, chromium oxide, boron oxide and phosphorus oxide, deposited on a silica carrier, in an atomic ratio of V : Cr : B : P of 1 : 0.5 – 2.0 : 0.1 – 1.2 : 0.01 – 0.3 and a catalyst concentration of 20 to 80 % by weight at a reaction temperature of 300° to 500°C for a contact time of 0.5 to 30 seconds.

3,959,340
CYANO-DISTYRYLBENZENES

Kurt Weber, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 42,598, June 1, 1970, Pat. No. 3,849,485. This application June 10, 1974, Ser. No. 477,947
Claims priority, application Switzerland, June 5, 1969, 8652/69
Int. Cl.² C07C *121/60*
U.S. Cl. 260—465 K 5 Claims

1. Di-styrylbenzene derivatives of the formula



wherein R_a represents a nitrile group located in positions 2 or 3, R_2' denotes hydrogen, chlorine, fluorine or an alkyl group containing 1 to 4 carbon atoms, R_3 denotes hydrogen or an alkoxy group located in positions 2 and/or 3, with 1 to 4 carbon atoms, M denotes a hydrogen, alkali, alkaline earth, ammonium or amine salt ion and m denotes the numbers 1 or 2, with the proviso that 1. at least one of the substituents is different from hydrogen, 2. in the case where R_a is different from hydrogen, the symbols R_2' and R_3 represent hydrogen, and 3. the total number of the substituents which are different from hydrogen is not more than 3.

3,959,341
PROCESS FOR LOW AMMONIA OPERATION OF THE NITRILE SYNTHESIS

Bobby Eugene Dunn, Murray, Ky., assignor to The B.F. Goodrich Company, Akron, Ohio

Division of Ser. No. 291,741, Sept. 25, 1972, abandoned. This application Aug. 26, 1974, Ser. No. 500,802
Int. Cl.² C07C *120/00*
U.S. Cl. 260—465.3 2 Claims

1. In the synthesis of an unsaturated aliphatic nitrile selected from the class consisting of acrylonitrile and methacrylonitrile by the ammoxidation of a gaseous mixture of a 1-monoolefin selected from the class consists of propylene and isobutylene, ammonia and oxygen over a solid ammoxidation catalyst at a reaction temperature of from about 550° to about 1100° F., the improvement which comprises establishing the flow of a portion of the effluent gases leaving said catalyst through a gas sampling circuit, conditioning the said effluent gases flowing in said circuit by adjusting the temperature of said gases therein to a relatively constant temperature in the range of from about 350° to about 450° F. and removing solid particles therein larger than about 5 microns in diameter, periodically analyzing the resulting conditioned and low solids gases with a mass spectrometer to determine at least the concentration of unreacted ammonia and of unreacted oxygen therein, and where required in response to the resulting analysis, readjusting the composition of said gaseous mixture fed to said catalyst to insure in said gaseous mixture fed to the reactor an ammonia: monoolefin molar feed ratio between about 1.03:1 and about 1.07:1 and to insure in said effluent gases an unreacted oxygen content of from about 4 to about 7 mol percent.

3,959,342
PROCESS FOR THE PREPARATION OF NITRILOTRIACETONITRILE (NTN)

Otto A. Homberg, Easton, and Alan H. Singleton, Emmaus, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation-in-part of Ser. No. 66,255, Aug. 24, 1970, abandoned. This application Dec. 10, 1974, Ser. No. 531,273
Int. Cl.² C07C *120/00*
U.S. Cl. 260—465.5 A 6 Claims

1. A process for the preparation of nitrilotriacetonitrile comprising:

a. preparing a first aqueous solution of formaldehyde and at least one member selected from the group consisting of ammonia and ammonium salts of strong mineral acids, which solution contains no other components which would affect the pH of said solution;

b. preparing a second aqueous solution of hydrogen cyanide and a strong mineral acid wherein the strong mineral acid is present in an amount precalculated to maintain the pH of the reaction of sub-paragraph (c) at a pH of about one or less;

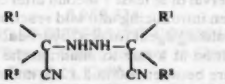
c. reacting said first aqueous solution with said second aqueous solution by combining said first aqueous solution and said second aqueous solution at a temperature from about 35° C to about 70° C.

3,959,343
PROCESS FOR PRODUCING HYDRAZONITRILES

Masanori Arashi, Tokyo; Hisahiko Shimada, Ashiya; Shigeyuki Fujituka, Tokorozawa; Kimio Kamiya, Kawagoe, and Tomoyuki Miyazaki, Fujisawa, all of Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 25, 1974, Ser. No. 518,202
Int. Cl.² C07C *120/00*
U.S. Cl. 260—465.5 R 8 Claims

1. A process for preparing a hydrazo compound of the formula,



(III)

wherein R^1 is $C_1 - C_6$ alkyl, phenyl, benzyl, benzyl substituted with nitro or chloro, $C_3 - C_8$ cycloalkyl, ($C_1 - C_4$ alkoxy)-$C_1 - C_4$ alkyl or ($C_1 - C_3$ alkyl)-carboxyl radical; and R^2 is $C_1 - C_6$ alkyl, or R^1 together with R^2 may form cycloalkyl, which process comprises reacting a ketazine of the formula,

(II)

wherein R^1 and R^2 are as defined above, with hydrogen cyanide at a temperature of from 10°C to 40°C and 0.1 to 10% by weight, based on the weight of the ketazine, of a sulfate, chloride, bromide, bromate, acetate, nitrate, oxalate or succinate of a metal selected from the group sonsisting of zinc, tin, iron, copper, aluminum, antimony, tellurium and bismuth.

3,959,344

PROCESS FOR THE PREPARATION OF DIAMINOMALEONITRILE

Yukio Tadokoro, Tokyo; Tadao Shirai, Mobara; Satoshi Sogabe, Mobara, and Seikichi Yoshikawa, Mobara, all of Japan, assignors to Nippon Chemicals Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 314,034, Dec. 11, 1972, abandoned. This application Dec. 17, 1974, Ser. No. 533,473

Int. Cl.² C07C *120/00*

U.S. Cl. 260—465.5 R **10 Claims**

1. A process for the preparation of diaminomaleonitrile comprising polymerizing at a temperature of from 30° to 140°C hydrogen cyanide in a solvent consists of a mononitrile selected from the group consisting of acetonitrile, propionitrile, n-butyronitrile, isobutyronitrile, methacrylonitrile, benzonitrile, o-tolunitrile, m-tolunitrile and p-tolunitrile in the presence of a basic compound, wherein the weight ratio of the mononitrile to hydrogen cyanide is 1:1 to 100:1.

3,959,345

PRODUCTION OF MALEONITRILE

Katsura Morita; Naoto Hashimoto, and Koichi Matsumura, all of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 30, 1975, Ser. No. 545,395

Claims priority, application Japan, Feb. 18, 1974, 49-19669

Int. Cl.² C07C *120/00*

U.S. Cl. 260—465.8 R **11 Claims**

1. A method for producing maleonitrile, which comprises reacting cyanoacetylene with hydrogen cyanide in an organic solvent.

3,959,346

RACEMIC PROSTAGLANDINS OF THE 2-SERIES AND ANALOGS THEREOF

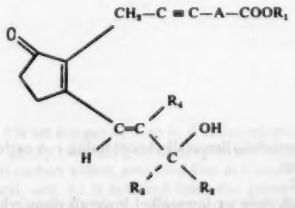
William P. Schneider, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 807,405, March 14, 1969, abandoned. This application Dec. 6, 1974, Ser. No. 530,448

Int. Cl.² C07C *61/38*, *69/74*

U.S. Cl. 260—468 D **12 Claims**

1. A racemic compound of the formula:



wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one to 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein R_2 is $-(CH_2)_a-CH_3$ wherein *a* is 2, 3, 4, 5, or 6, or $-(CH_2)_d-X$ wherein *d* is zero, one, 2, 3, or 4 and X is isobutyl, tert-butyl, 3,3-difluorobutyl, 4,4-difluorobutyl, or 4,4,4-trifluorobutyl; wherein R_3 and R_4 are hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein A is trimethylene or $-CH_2-Z-$ wherein Z is ethylene substituted with one or 2 fluoro, methyl, or ethyl; and pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,959,347

MANUFACTURE OF ALKYL ESTERS OF POLYCARBOXYLIC ACIDS

Jean Berthoux, Decines, and Ghislain Schwachhofer, Miribel, both of France, assignors to Rhone-Progil, Paris, France

Filed June 25, 1973, Ser. No. 372,956

Claims priority, application France, July 31, 1972, 72.28141

Int. Cl.² C07C *67/10*

U.S. Cl. 260—468 K **6 Claims**

1. In a process for producing alkyl esters of polycarboxylic acids comprising the step of reacting an alkaline salt of a polycarboxylic acid, having carboxylic groups derived from saturated or unsaturated aliphatic, cycloaliphatic, aromatic, or alkylaromatic di- or polyacids with at least one halo-alkane having 6 to 20 atoms, in an heterogeneous organic-aqueous medium, in the presence of a catalyst, at a temperature between substantially 130° and 200° C during a reaction time between 30 minutes and 6 hours, the improvement wherein the production of partial esters is substantially eliminated comprising limiting the rate of conversion of the alkaline salt to between 35 to 85% so that substantially no partial esters are formed.

3,959,348

LIQUID ORGANIC POLYISOCYANATES CONTAINING CARBOXYL AND/OR CARBOXYLATE GROUPS

Helmut Reiff, New Martinsville, W. Va.; Peter Markusch, Cologne, and Dieter Dieterich, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 26, 1974, Ser. No. 527,389

Claims priority, application Germany, Nov. 30, 1973, 2359613

Int. Cl.² C07C *119/048*, *155/02*

U.S. Cl. 260—471 C **4 Claims**

1. Liquid aromatic polyisocyanates which contain carboxyl or carboxylated groups, prepared by a process which comprises reacting:

A. a liquid multicomponent mixture of aromatic polyisocyanates which have an isocyanate content of 18 to 35% by weight and a viscosity of 8 cP to 10,000 cP at 25°C, said multicomponent mixture selected from the group consisting of:
   i. phosgenation products of the condensates of:
      a. aniline or alkyl groups substituted anilines, and
      b. aldehydes or ketones;
   ii. distillation residues obtained from the distillation of crude tolylene diisocyanate mixture and which residues contain less than about 50% by weight of free tolylene diisocyanate isomers;
   iii. reaction products of (i) or (ii) and 0.2 to 25 mol % of an organic polyol;
   iv. a mixture of (i) and from 1 to 30% by weight of an isocyanate selected from the group consisting of tolylene diisocyanate and 2,4′-diphenylmethane diisocyanate; and
   v. mixtures thereof, and

B. a compound selected from the group consisting of:
   i. carboxylic acid salts of an hydroxycarboxylic or mercapto carboxylic acid; and
   ii. an hydroxy carboxylic or mercapto carboxylic acid wherein

a. at least partial conversion of carboxyl group into the corresponding carboxylate group by neutralization with a base is carried out simultaneously with or after the isocyanate addition reaction, or

b. the hydroxy carboxylic acid or mercapto carboxylic acid is of the kind which the carboxyl groups are much less reactive with isocyanate groups than are the hydroxy or mercapto groups,

the product of said process having an isocyanate content of from 18 to 35% by weight and having a carboxyl or carboxylate group content of from 0.1 to 10% by weight.

3,959,349

2-HYDROXY-3(4-ALKYLPHENYL)-3-BUTENOIC ACID ESTER AND PROCESS FOR THE PRODUCTION THEREOF

Katsura Kogure, Kawagoe; Hiroyasu Koyama, Ohi, and Kunio Nakagawa, Kawagoe, all of Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

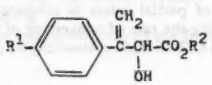
Division of Ser. No. 436,632, Jan. 25, 1974, Pat. No. 3,927,084. This application Nov. 22, 1974, Ser. No. 526,304

Claims priority, application Japan, Jan. 29, 1973, 48-11164; Jan. 29, 1973, 48-11165

Int. Cl.² C07C *69/88*

U.S. Cl. 260—473 A **2 Claims**

1. A 2-hydroxy-3-(4-alkylphenyl)-3-butenoic acid ester of the formula



wherein R^1 is an alkyl group of 2–4 carbon atoms and R^2 is an alkyl group of 1–3 carbon atoms.

3,959,350

MELT-FUSIBLE LINEAR POLYIMIDE OF 2,2-BIS(3,4-DICARBOXYPHENYL)-HEXAFLUOROPROPANE DIANHYDRIDE

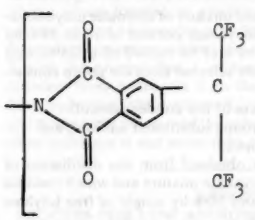
Francis Elliot Rogers, Dayton, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

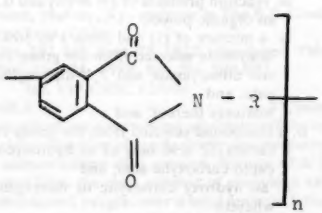
Filed May 17, 1971, Ser. No. 144,339

Int. Cl.² C08G *73/10*

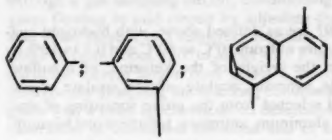
U.S. Cl. 260—47 C **5 Claims**

1. A melt-fusible linear polyimide polymeric material having the following recurring structural unit:

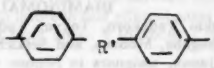




wherein R is selected from aromatic groups of the group consisting of



and



wherein R′ is a divalent bridging radical selected from the group of —O—, —S—, and —O—R″—O— wherein R″ is phenylene, and n is a number sufficient to provide a polymer having an inherent viscosity of at least about 0.15 measured as a solution of the polymer in sulfuric acid at 30°C., said polyimide having a glass transition temperature of between about 220°C. and about 385°C.

3,959,351

HALOALKYLBENZOYL ESTERS OF DI-LOWER ALKYLAMINO ALKANOLS AND QUATERNARY LOWER ALKYL SALTS THEREOF

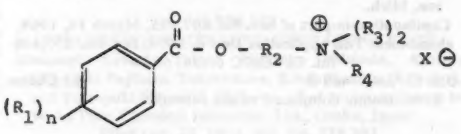
Richard A. Day, Cleves, and Rasikkumar N. Gohil, Cincinnati, both of Ohio, assignors to Research Corporation, New York, N.Y.

Filed July 24, 1972, Ser. No. 274,716

Int. Cl.² C07C *93/20*

U.S. Cl. 260—477 **9 Claims**

1. A compound having the formula



wherein

R_1 is a (monohalo)loweralkyl containing 1–6 carbon atoms or formyl,

n is 1 or 2,

R_2 loweralkylene or loweralkyl loweralkylene wherein the moiety contains 2–6 carbon atoms,

R_3 is loweralkyl of 1–6 carbon atoms,

R_4 is loweralkyl of 1–6 carbon atoms, and

X is halide or sulfate.

3,959,352

PROCESS FOR PREPARING A CARBOXYLIC ESTER

Takeru Onoda; Keisuke Wada, both of Yokohama, and Masayuki Otake, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Mar. 7, 1975, Ser. No. 556,265

Claims priority, application Japan, Mar. 12, 1974, 49-28416; July 10, 1974, 49-79007

Int. Cl.² C07C 67/05

U.S. Cl. 260—479 R 21 Claims

1. In a process for preparing a carboxylic ester by reacting benzene with an aliphatic saturated carboxylic acid having 2 to 4 carbon atoms and molecular oxygen in the vapor phase in the presence of a supported solid catalyst of palladium metal, antimony oxide and a carboxylic acid salt of an alkali metal, an alkaline earth metal, zinc, cadmium, lead or tin, the improvement comprising: adding said antimony oxide to the support of said catalyst by dipping a carrier into an aqueous solution of a water soluble antimony compound selected from the group consisting of antimonic acid, antimonates and antimony complexes of organic acids.

3,959,353

ESTERS OF HYDROXYARYL ADDUCTS OF DECACHLOROPENTACYCLO (5.3.0.0^{2,6}.0^{4,10}0^{5,9}) DECANE-3-ONE

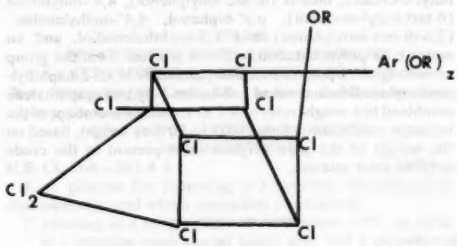
Stephen M. Creighton, Edmonton, Canada, assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Division of Ser. No. 64,089, July 28, 1970, Pat. No. 3,816,543, which is a continuation of Ser. No. 592,719, Nov. 8, 1966, abandoned, which is a continuation-in-part of Ser. No. 191,703, May 2, 1962, abandoned. This application May 29, 1973, Ser. No. 364,561

Int. Cl.² C07C 69/02, 69/54

U.S. Cl. 260—479 R 10 Claims

1. A compound of the formula



wherein z is an integer of 1 to 6; R is independently selected from the group consisting of hydrogen and hydrocarbyl acyl of 1 to 10 carbon atoms, provided that at least one R is hydrocarbyl acyl; and Ar is selected from the group consisting of phenyl, naphthyl, and substituted aryl of from 6 to 24 carbon atoms, wherein said aryl nucleus is phenyl or naphthyl and said substituents are independently selected from the group consisting of

a. alkyl of 1 to 18 carbon atoms;

b. cyclohexyl or cyclopentyl;

c. hydrocarbyl aralkyl of 7 to 18 carbon atoms; and

d. a halogen independently selected from the group consisting of fluorine, chlorine or bromine.

3,959,354

PROCESS FOR PREPARING PHENYL ESTER

Takeru Onoda, and Keisuke Wada, both of Yokohama, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed June 3, 1974, Ser. No. 475,894

Claims priority, application Japan, June 1, 1973, 48-61525

Int. Cl.² C07C 67/00

U.S. Cl. 260—479 R 9 Claims

1. In a process for preparing a phenyl ester and/or phenol by reacting benzene, a carboxylic acid and molecular oxygen in the presence of a catalyst, the improvement which comprises:

conducting said reaction in the presence of a catalyst consisting essentially of 0.1–20 wt.% of palladium metal, an antimony component formed by incomplete reduction of antimony oxide to antimony oxide and antimony metal and present in amounts of 100–500 atomic percent as Sb based on palladium and at least one carboxylic acid salt of zinc, cadmium, lead or tin in an amount ranging from 10 to 800 atomic percent as the metal based on palladium supported on a carrier.

3,959,355

MONOMERIC EMULSION STABILIZERS DERIVED FROM ALKYL/ALKENYL SUCCINIC ANHYDRIDE

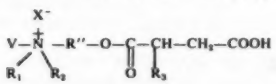
Carlos M. Samour, 324 Linden St., Wellesley, Mass. 02181, and Mildred C. Richards, 32 W. Park Drive, Wakefield, Mass. 01880

Division of Ser. No. 309,038, Nov. 24, 1972, Pat. No. 3,839,419, which is a division of Ser. No. 40,718, May 26, 1970, Pat. No. 3,751,451, which is a continuation-in-part of Ser. No. 867,900, Oct. 20, 1969, abandoned. This application June 6, 1974, Ser. No. 476,950

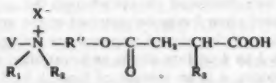
Int. Cl.² C07C 101/06

U.S. Cl. 260—482 R 3 Claims

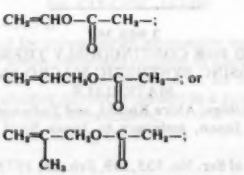
1. A compound having the formula



or



wherein V is



R'' is ethylene, propylene, isopropylene, 2-hydroxypropylene, acetoxypropylene or $-CH_2-CHR_4(O-CH_2-CHR_4)_n$ wherein n is zero to 4 and R_4 is hydrogen or methyl;

R_1 and R_2 are independently selected from the group consisting of alkyl and hydroxyalkyl of 1 to 7 carbon atoms;

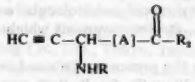
R_3 is a lipophilic aliphatic hydrocarbon group having from 7 to 28 carbon atoms; and X^- is halide, alkyl sulfate wherein the alkyl moiety has 1 to 4 carbon atoms, or toluene sulfonate.

3,959,356
ACETYLENE DERIVATIVES OF AMINO ACIDS

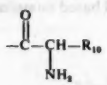
Brian Walter Metcalf, Strasbourg, and Michel Jung, Illkirch, both of France, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Mar. 18, 1975, Ser. No. 559,547
Int. Cl.² C07C *101/00*, *101/28*
U.S. Cl. 260—482 R **12 Claims**

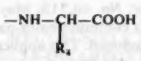
1. A compound of the formula



wherein R is hydrogen, alkylcarbonyl wherein the alkyl moiety contains from 1 to 4 carbon atoms, alkoxycarbonyl wherein the alkoxy moiety contains from 1 to 4 carbon atoms and may be straight or branched or



wherein R_{10} is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; R_9 is hydroxy, straight or branched alkoxy group of from 1 to 8 carbon atoms, a lower alkylamino group wherein the alkyl moiety contains from 1 to 4 carbon atoms or



wherein R_4 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl with the proviso that when R_9 is lower alkylamino group, R is alkoxycarbonyl; [A] is —CH=CH— or

wherein R_1 is hydrogen, lower alkyl of from 1 to 4 carbon atoms, phenyl or substituted phenyl wherein the substituents on the substituted phenyl may be attached at the ortho, meta or para-positions of the phenyl ring and are halogen, lower alkoxy of from 1 to 4 carbon atoms or lower alkyl of from 1 to 4 carbon atoms; n is an integer of from 1 to 5; and the pharmaceutically acceptable salts and individual optical isomers thereof.

3,959,357
METHOD FOR CONTINUOUSLY THERMALLY DECOMPOSING SYNTHETIC MACRO-MOLECULE MATERIALS

Hiroyuki Tokushige; Akira Kosaki, and Tadamoto Sakai, all of Hiroshima, Japan, assignors to Japan Steel Works, Ltd., Japan

Continuation of Ser. No. 335,309, Feb. 23, 1973, abandoned. This application Dec. 12, 1974, Ser. No. 532,064
Int. Cl.² C07C *69/54*
U.S. Cl. 260—486 R **4 Claims**

1. Method for continuously thermally decomposing a synthetic macro-molecule composition consisting essentially of an organic polymer selected from the group consisting of polystyrene; copolymer of acrylonitrile, butadiene and styrene; polymethylmethacrylate; polypropylene; and polyethylene, comprising the steps of continuously supplying said synthetic macro-molecule composition in an extruder and having a cylinder with means for heating said composition to a temperature of from 500°C to 600°C and discharge orifices for removing volatile products, said extruder being capable of subjecting said synthetic macro-molecule composition to shearing and kneading, transporting said synthetic macro-molecule composition within said extruder and continuously shearing and kneading said composition, continuously heating and thermally decomposing said synthetic macro-molecule composition in said cylinder of said extruder at a temperature from about 500°C to about 600°C, discharging low molecular weight volatilized products of not more than about 35 carbon atoms from thermally decomposing said composition through said discharge orifices in said cylinder of said extruder, conveying said low molecular weight volatilized products of not more than about 35 carbon atoms to condensing means directly connected to said discharge orifices, and condensing said low molecular weight volatilized products in said condensing means as products having from about 5 to about 35 carbon atoms per molecule.

3,959,358
POLYMERIZATION INHIBITION OF ACRYLATE ESTERS

Myron J. Jursich, Chicago, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Jan. 8, 1975, Ser. No. 539,219
Int. Cl.² C07C *69/54*
U.S. Cl. 260—486 R **3 Claims**

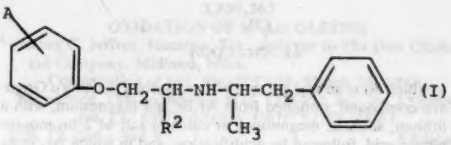
1. A method for inhibiting the polymerization of crude dimethylaminoethyl methacrylate during its purification by distillation which comprises conducting said distillation in the presence of an inhibitor combination consisting essentially of a phenolictype polymerization inhibitor selected from the group consisting of: o-tert-butylphenol, p-methoxyphenol, 2,6-di-tert-butyl-p-cresol, 2,2′-methylenebis (6-tert-butyl-p-cresol), 4,4′thiobis (6-tert-butyl-m-cresol, 4,4′-thiobis (6-tert-butyl-o-cresol), thiobis (di-sec-amylphenol), 4,4′-butylidene (6-tert-butyl-m-cresol), p,p′-biphenol, 4,4′-methylenebis (2,6-di-tert-butylphenol) and 1,5-naphthalenediol, and an amine-type polymerization inhibitor selected from the group consisting of: N-phenyl-1-naphthylamine, N,N′-di-2-naphthyl-p-phenylenediamine, and 7-amino-1-hydroxynaphthalene combined in a weight ratio of 4:1 to 1:4 with the amount of the inhibitor combination being 0.01 to 20% by weight, based on the weight of the pure acrylate ester present in the crude acrylate ester mixture.

3,959,359
PHENOXYALKYLAMINES, PROCESS FOR THEIR PREPARATION AND THERAPEUTICAL COMPOSITION CONTAINING SAME

Henri Pinhas, Paris, France, assignor to Laboratoires Laroche Navarron, Puteaux, France

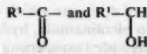
Continuation-in-part of Ser. No. 211,113, Dec. 22, 1971, abandoned, which is a continuation-in-part of Ser. No. 791,524, Jan. 15, 1969, abandoned. This application Dec. 11, 1974, Ser. No. 531,767
Claims priority, application France, Jan. 23, 1968, 68.136966
Int. Cl.² C07C *91/16*
U.S. Cl. 260—501.18 **11 Claims**

1. A compound selected from the group consisting of phenoxyalkylamines of the formula:



(I)

wherein R^2 is a radical selected from the group consisting of hydrogen and methyl and A is a radical selected from the group consisting of



wherein R^1 is an alkyl radical having 2–6 carbon atoms and the non-toxic acid addition salts thereof.

3,959,360

PROCESS FOR PREPARING 1-HYDROXY, ETHYLIDENE-1,1-DIPHOSPHONIC ACID

Steve Vazopolos, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed July 31, 1975, Ser. No. 600,691
Int. Cl.² C07F *9/38*
U.S. Cl. 260—502.4 A **21 Claims**

1. A process for preparing a 1-hydroxy, ethylidene-1,1-diphosphonic acid which comprises the steps of:

1. reacting at a temperature of from about 50°C. to 80°C. in a reaction zone glacial acetic acid and a phosphorus trihalide selected from the group consisting of phosphorus tribromide and phosphorus trichloride in a molar ratio of at least about 2.5:1 in an homogenous, single-phase liquid reaction mixture, while continuously removing by-product acetyl halide as formed from said reaction zone,
2. heating said reaction mixture to a temperature of from about 90°C. to 140°C.,
3. adding and reacting with said reaction mixture at said temperature acetic anhydride in a molar ratio of from about 0.3 to 0.6 anhydride to phosphorus trihalide charged into the initial reaction, whereby a normally solid anhydrous reaction product is formed, and
4. thereafter hydrolyzing said normally solid anhydrous reaction product by steaming to recover said 1-hydroxy, ethylidene-1,1-diphosphonic acid.

3,959,361

PROCESS OF PRODUCING AMINO METHYLENE PHOSPHONIC ACIDS

Friedrich Krueger, Edingen; Lieselotte Bauer, Bad Duerkheim, and Walter Michel, Ilvesheim, all of Germany, assignors to Joh. A. Benckiser GmbH, Ludwigshafen, Germany

Division of Ser. No. 125,857, March 18, 1971, Pat. No. 3,816,517. This application Dec. 11, 1973, Ser. No. 423,689
Claims priority, application Germany, Mar. 20, 1970, 2013371
The portion of the term of this patent subsequent to Mar. 12, 1991, has been disclaimed.
Int. Cl.² C07F *9/38*
U.S. Cl. 260—502.5 **13 Claims**

1. A process for the preparation of an amino-methylene phosphonic acid comprising the steps of reacting a mixture consisting of an α-amino carboxylic acid compound selected from the group consisting of ethylene diamine tetraacetic acid, nitrilo triacetic acid, glycine bis-(methylene phosphonic acid), sarcosine mono-(methylene phosphonic acid), diethylene triamine pentaacetic acid, imino diacetic acid mono-(methylene phosphonic acid) and the alkali metal salts thereof, from about 1 mole to 3 moles based on each mole of carboxyl groups present in said alpha-amino carboxylic acid compound of a phosphorus source selected from the group consisting of (a) a mixture of phosphorous acid and a phosphorus trihalide selected from the group consisting of phosphorus trichloride, phosphorus tribromide and phosphorus triiodide, and (b) a mixture of said phosphorus trihalide and an amount of water sufficient to react therewith to produce a mixture of phosphorous acid and said phosphorus trihalide, and an inert organic diluent selected from the group consisting of tetrachloro ethane, trichloro ethylene, tetrachloro ethylene, carbon tetrachloride, o-chloro toluene, dichloro benzene, monochloro benzene, paraffin and toluene at an elevated temperature between 60°C. and the boiling point of said organic diluent, whereby the carboxylic acid groups are replaced by phosphonic groups, and thereafter recovering the resulting amino methylene phosphonic acid compound from the reaction mixture.

3,959,362

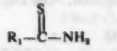
AMMONIUM MERCAPTOALKANESULFONATE SALTS, THEIR PREPARATION, PHOTOGRAPHIC FIXING SOLUTIONS CONTAINING SAME, AND METHOD OF FIXING PHOTOGRAPHIC FILM THEREWITH

Hans Gway Ling, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 24, 1973, Ser. No. 400,100
Int. Cl.² C07C *143/06*
U.S. Cl. 260—513 R **6 Claims**

1. A method for preparing an ammonium mercaptoalkanesulfonate salt which comprises reacting at about 60° to 150°C a thioamide and a sultone dissolved in an alcohol solvent wherein said alcohol solvent is present in a ratio of 10 to 100 moles per total moles of reactants,

a. said thioamide having the formula



wherein R_1 is an alkyl radical having 1 to 4 carbon atoms,

b. said sultone having the formula

wherein R is an alkylene group having 3 to 5 carbon atoms,

c. said alcohol solvent having the formula R_2OH wherein R_2 is an alkyl radical having 1 to 6 carbon atoms.

3,959,363

15-ETHYNYL-PGF$_{2\beta}$

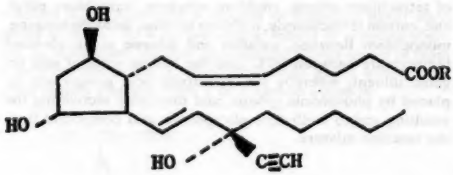
Donald P. Strike, St. David, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Sept. 25, 1974, Ser. No. 509,173

Int. Cl.² C07C *61/38*, *69/74*

U.S. Cl. 260—514 D 2 Claims

1. A chemical compound of the structure:



wherein R is hydrogen, alkyl of from 1 to 6 carbon atoms, an alkali metal cation, or a pharmacologically acceptable cation derived from ammonia or a basic amine.

3,959,364

PREPARATION OF ARYLALKANOIC ACIDS

Bernard J. Armitage; James E. Jeffery; John S. Nicholson, all of Beeston, and James G. Tantum, Nuthall, all of England, assignors to The Boots Company Limited, Nottingham, England

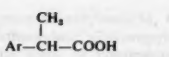
Filed May 20, 1974, Ser. No. 471,308

Claims priority, application United Kingdom, May 24, 1973, 24844/73

Int. Cl.² C07C *51/00*

U.S. Cl. 260—515 R 20 Claims

1. A proces for the preparation of a compound of formula I



in which Ar is an aryl group which comprises reacting a Grignard compound, obtained from Ar_1Br and magnesium, with a lithium, sodium, magnesium or calcium salt of 2-bromopropionic acid, followed by acidification, and in which Ar_1 is Ar or a group convertible to Ar during the acidification.

3,959,365

SYNTHESIS OF D,1-LYSINE FROM 2-CYANOPYRIDINE

Terry G. Muench, Antioch, Calif., and George E. Ham, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 21, 1974, Ser. No. 471,949

Int. Cl.² C07C *99/10*

U.S. Cl. 260—534 L 8 Claims

1. The method for the preparation of d,l-lysine which comprises hydrolyzing 2-cyanopyridine to picolinamide, hydrogenating the picolinamide to pipecolamide, converting the pipecolamide to 1-acetyl-2-cyanopiperidine with acetic anhydride, reacting 1-acetyl-2-cyanopiperidine with a compound which yields ammonium ions or a mixture thereof with a compound which yields carbonate ions and hydrolyzing the resulting product to d,l-lysine.

3,959,366

POLYENES FROM DIPHENYL ETHERS

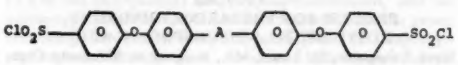
Shrikant V. Dighe, Silver Spring, and Richard W. Bush, Columbia, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 303,848, Nov. 6, 1972, Pat. No. 3,856,858. This application June 24, 1974, Ser. No. 482,735

Int. Cl.² C07C *143/78*, *143/79*

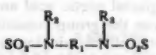
U.S. Cl. 260—543 R 4 Claims

1. A compound having the formula



in which:

a. A is



b. R_1 is

or

an alkylene group having 2–12 carbon atoms and

c. R_2 and R_3 are hydrogen.

3,959,367
OXIDATION OF HALO-OLEFINS

Gaines C. Jeffrey, Houston, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 715,974, March 26, 1968, abandoned. This application Mar. 12, 1971, Ser. No. 123,889
Int. Cl.² C07D *301/06*; C07C *51/32*, *45/04*
U.S. Cl. 260—544 Y 5 Claims

1. A process for the liquid phase oxidation of polyhaloolefins having from 2 to 7 carbon atoms to obtain oxidation products having the same number of carbon atoms as the starting material, said process comprising heating the polyhalo-olefin in admixture with oxygen at temperatures of from about 70°C to about 300°C and O_2 pressures of from about 100 to 1200 p.s.i.g. in the absence of an added catalyst, said process being carried out in two stages in two reactors connected in series wherein the first reactor has a volume of about twice that of the second reactor.

3,959,368
N,N-DIMETHYL-N'-PHENYLTHIOCARBAMYL FORMAMIDINE AND ITS USE AS AN ANTI-INFLAMMATORY AGENT

Jack R. DeBaun, Sunnyvale; Ferenc M. Pallos, Walnut Creek, and Eugene G. Teach, El Cerrito, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 28, 1975, Ser. No. 572,242
Int. Cl.² C07C *127/16*, *133/04*
U.S. Cl. 260—552 SC 1 Claim

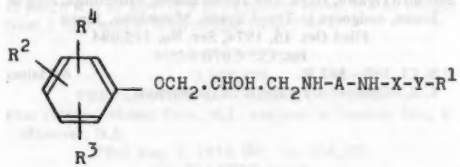
1. N,N-dimethyl-N'-phenylthiocarbamyl formamidine.

3,959,369
ALKANOLAMINE DERIVATIVES

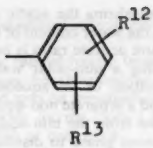
Leslie Harold Smith, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 25, 1974, Ser. No. 526,921
Claims priority, application United Kingdom, Dec. 12, 1973, 57517/73
Int. Cl.² C07C *103/30*
U.S. Cl. 260—553 R 12 Claims

1. An alkanolamine derivative selected from a compound of the formula:



wherein A is alkylene of from 2 to 12 carbon atoms; wherein R^1 is hydrogen, alkyl, halogenoalkyl, alkenyl or cycloalkyl each of up to 10 carbon atoms, or aryl of the formula:



wherein R^2, R^3, R^{12} and R^{13}, which may be the same or different, each is hydrogen, halogen, hydroxy, amino, nitro or cyano, or alkyl, cycloalkyl, alkenyl, alkynyl, alkoxy, alkylthio, cycloalkoxy, alkenyloxy, alkynyloxy or alkanoyl each of up to 6 carbon atoms, or aryl, aryloxy or aralkoxy each of up to 12 carbon atoms; or wherein R^{12} and R^{13} together are trimethylene, tetramethylene, propenylene, but-2-enylene or buta-1,3-dienylene such that together with the adjacent benzene ring they form respectively indanyl, 5,6,7,8-tetrahydronaphthyl, indenyl, 5,8-dihydronaphthyl or naphthyl; wherein R^4 stands for a substituent of the formula:

$R^{15}R^{16}N\text{-}CO\text{-}Q\text{-}$
$R^{15}R^{16}N\text{-}CO\text{-}NH\text{-}Q\text{-}$
$R^{15}R^{16}N\text{-}CO\text{-}Q^1\text{-}O\text{-}$
$R^{16}\text{-}X\text{-}NR^{15}\text{-}Q\text{-}$

or

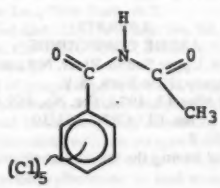
wherein Q is a direct link or is alkylenne or alkenylene each of up to 6 carbon atoms; wherein Q^1 is alkylene of up to 6 carbon atoms; wherein R^{15} is hydrogen or alkyl of up to 6 carbon atoms; wherein R^{16} is hydrogen, or alkenyl, cycloalkyl, hydroxyalkyl or alkoxyalkyl each of up to 6 carbon atoms, or alkyl, aryl, aralkyl or aralkenyl each of up to 10 carbon atoms; wherein X is carbonyl (-CO-) and wherein Y is imino (-NH-), or alkylimino, iminoalkylene, iminoalkyleneoxy or iminoalkylenecarbonyloxy each of up to 6 carbon atoms, and a non-toxic, pharmaceutically-acceptable acid-addition salt thereof.

3,959,370
N-ACETYL-POLYCHLOROBENZAMIDE COMPOUNDS

Lewis William Watts, Jr., Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

Filed July 16, 1973, Ser. No. 379,460
Int. Cl.² C07C *103/75*
U.S. Cl. 260—558 D 8 Claims

1. The compound N-acetyl-pentachlorobenzamide of the formula



3,959,371
PROCESS FOR THE PURIFICATION OF N,N-DIMETHYLACETAMIDE

Gilbert Gavlin, Lincolnwood, and Abid Hashim Bengali, Chicago, both of Ill., assignors to Custom Organics, Inc., Chicago, Ill.

Filed Oct. 8, 1974, Ser. No. 513,106
Int. Cl.² B01D *3/34*; C07C *102/04*, *103/34*
U.S. Cl. 260—561 R 5 Claims

1. A process for the separation of N,N-dimethylacetamide from a mixture of N,N-dimethylacetamide and acetic acid

which comprises neutralizing the acetic acid with potassium hydroxide, adjusting the water content of the mixture whereby the water to potassium acetate ratio is between about 1/1 to 3/1 by weight, adding a non-polar water non-solvent and permitting the formation of an aqueous phase containing potassium acetate and a separate non-aqueous phase, separating the aqueous phase from the non-aqueous phase and subjecting the non-aqueous phase to distillation to remove the solvent.

3,959,372

GLYOXYLIC ACID HYDRAZIDE-2-ACYLHYDRAZONE COMPOUNDS

Helmut Timmler, and Wilfried Draber, both of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

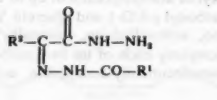
Filed Dec. 11, 1974, Ser. No. 531,637

Claims priority, application Germany, Dec. 24, 1973, 2364474

Int. Cl.² C07C *103/32*

U.S. Cl. 260—561 H 14 Claims

1. Glyoxylic acid hydrazide-2-acylhydrazone compound of the formula:



(I)

in which

R^1 is hydrogen or alkyl, and

R^2 is alkyl, phenyl, or substituted phenyl wherein the substituents are selected from alkyl, alkoxy, alkylthio, alkylsulfonyl, halogen, haloalkyl or haloalkoxy, nitro, nitrile and thiocyanato.

3,959,373

AMIDE COMPOUNDS

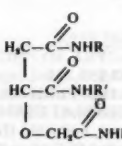
Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed May 13, 1974, Ser. No. 469,492

Int. Cl.² C07C *103/30*

U.S. Cl. 260—561 B 9 Claims

1. A compound having the molecular structure

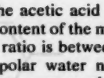


wherein R, R′ and R″, which may be the same, or different are selected from the group consisting of:

a. hydrogen,

b. straight or branched chain hydrocarbon radicals having from 1 to about 18 carbon atoms, and

c.



wherein Z is selected from the group consisting of H and OH and when Z is H, Y is OH or CH_2OH, and when Z is OH, Y is CH_3, and

d. combinations of (a), (b), and (c).

3,959,374

PROCESS FOR THE PREPARATION OF MIXED ISOMERIC METHYLENE-BRIDGED POLYCYCLOHEXYLPOLYAMINES

Michael E. Brennan, and Ernest L. Yeakey, both of Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

Filed May 30, 1974, Ser. No. 474,380

Int. Cl.² C07C *87/40*

U.S. Cl. 260—563 B 17 Claims

1. In a process for the preparation of mixed isomeric methylene-bridged polycyclohexylpolyamines comprising hydrogenating a mixed isomeric methylene-bridged polyphenyl polyamine mixture at a temperature within the range of about 150° to about 250°C under a pressure of about 500 to about 15,000 psig in the presence of ammonia and a ruthenium-containing hydrogenation catalyst, the improvement comprising:

initially intimately contacting, in the presence of hydrogen, the mixed isomeric methylene-bridged polyphenyl polyamine mixture with a nickel-containing hydrogenation catalyst at a temperature of between about 25° to about 250°C under a pressure of about 500 to about 15,000 psig and for a time effective in preventing the rapid deactivation of said ruthenium-containing hydrogenation catalyst in said hydrogenating step; and then

hydrogenating said mixed isomeric methylene-bridged polyphenyl polyamine mixture in the presence of said ammonia and said ruthenium-containing hydrogenation catalyst.

3,959,375

2,5-DIDEOXYSTREPTAMINE AND THE PRODUCTION THEREOF

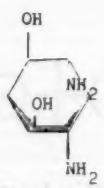
Seiichiro Ogawa, Hoya, and Tetsuo Suami, Musashino, both of Japan, assignors to Tetsyi Syanu, Musashino, Japan

Filed Oct. 15, 1974, Ser. No. 515,094

Int. Cl.² C07B *91/14*

U.S. Cl. 260—563 R 6 Claims

1. 2,5-Dideoxystreptamine of the formula



and an acid-addition salt thereof.

3,959,376
PRODUCTION OF 4-HALO-2-ALKENYL TRI-LOWER ALKYL AMMONIUM OR PHOSPHONIUM HALIDES

Louis E. Trapasso, Watchung, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Jan. 28, 1974, Ser. No. 437,091
Int. Cl.² C07C 85/04
U.S. Cl. 260—567.6 M 8 Claims

1. A process for producing 4-chloro-2-alkenyl tri-lower alkyl ammonium or phosphonium chloride which comprises reacting a 3,4-dichloroalkene-1 with a tri-lower alkyl amine or tri-lower alkyl phosphine, in a molar ratio of tri-lower alkyl amine or phosphine to 3,4-dichloroalkene-1 of about 2:1 to about 0.5:1, in a solvent at a temperature of from about 0°C to about 50°C for a period of time sufficient to yield the desired product.

3,959,377
METHOD FOR PREPARING 2-NITRO-4-AMINO-N-PHENYLANILINE

Milos S. Bil, Forest Hills, N.Y., assignor to Clairol Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 230,042, Feb. 28, 1972, which is a continuation-in-part of Ser. Nos. 92,868, Nov. 25, 1970, Pat. No. 3,758,499, and Ser. No. 93,465, Nov. 7, 1970, which is a division of Ser. No. 683,758, Nov. 2, 1967, abandoned, and Ser. No. 719,682, April 8, 1968, Pat. No. 3,632,582, and Ser. No. 725,936, May 1, 1968, Pat. No. 3,586,719. This application Oct. 30, 1972, Ser. No. 302,073
Int. Cl.² C07C 87/60
U.S. Cl. 260—576 10 Claims

1. In a process for preparing 2-nitro-4-amino-N-phenylaniline the improvement which comprises reacting 4-fluoro-3-nitroaniline with aniline at a temperature of about 140° to 150°C and recovering the 2-nitro-4-amino-N-phenylaniline, said reaction being carried out in the presence of large molar excess of aniline; the molar ratio of aniline to 4-fluoro-3-nitroaniline being 5:1 to 8:1.

3,959,378
N-ALKYL-N'-POLYHYDROXYALKYL-ALKYLENE DIAMINES

Hans-Werner Eckert, Dusseldorf, Germany, assignor to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed May 14, 1973, Ser. No. 359,989
Claims priority, application Germany, June 2, 1972, 2226869
Int. Cl.² C07C 91/10
U.S. Cl. 260—584 R 7 Claims

1. A compound of the formula

$$R—NH—(CH_2)_n—NH—CH_2—(CHOH)_m—CH_2OH$$

in which R is an alkyl of 8 to 24 carbon atoms, *n* is an integer from 2 to 6, and *m* is an integer from 3 to 4.

3,959,379
PREPARATION OF PRIMARY AMINES

Pius Ottiger, Mount Fern, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Aug. 5, 1974, Ser. No. 494,552
Int. Cl.² C07C 85/05
U.S. Cl. 260—584 R 17 Claims

1. A process for the preparation of a primary amine of the formula

$$R—CH_2—NH_2$$

wherein R is

A. an alkyl radical having from 1 to 7 carbon atoms, which may be unsubstituted or substituted by one or two members independently selected from the group consisting of hydroxy, phenyl, or cyclohexyl;

B. an alkenyl or alkadienyl radical having from 1 to 7 carbon atoms;

C. a cycloaliphatic radical having from 5 to 8 ring carbon atoms which may be saturated or mono-ethylenically unsaturated, and may be unsubstituted or substituted by from 1 to 3 alkyls having from 1 to 4 carbon atoms, which may be like or unlike; or

D. phenyl, which may be unsubstituted or substituted by one or two members independently selected from the group consisting of phenyl, chloro and alkyl having from 1 to 4 carbon atoms;

which comprises reacting an oxime of the formula

$$R—CH=NOH$$

wherein R is as defined,
with hydrazine in the presence of a catalytic amount of Raney nickel having from about 25 to 75 parts by weight of nickel and from about 75 to 25 parts by weight of aluminum in finely-divided form, in an alkanol having from 1 to 4 carbon atoms, at a temperature of from about 40° to 120°C., at about atmospheric pressure, and recovering the resulting primary amine.

3,959,380
PROCESS FOR PRODUCING 2-NITROCYCLOALKANONES

Shizuo Yamada; Hiroo Sasaki, and Tetsuo Tanaka, all of Nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Continuation-in-part of Ser. No. 231,536, March 3, 1972, abandoned. This application Mar. 19, 1975, Ser. No. 559,795
Claims priority, application Japan, Mar. 3, 1971, 46-10590
Int. Cl.² C07C 45/04
U.S. Cl. 260—586 R 3 Claims

1. A process for producing 2-nitrocycloalkanones, which comprises:

reacting in a one-step reaction, a cycloalkene having a carbon number of 5 – 12, with an oxygen containing gas and nitrogen dioxide in the presence of an aromatic hydrocarbon solvent having 6 – 10 carbon atoms and a dimethylsulfoxide catalyst, wherein the volume ratio of said catalyst to said solvent is 1 : 3 – 200 and the mole ratio of said catalyst to said cycloalkene is 1.0 – 10.0 : 1.

3,959,381
PHENOL AND CYCLOHEXANONE MANUFACTURE

Alfred Arkell, Wappingers Falls, N.Y.; Peter A. Riedl, Vienna, Austria, and Edwin R. Kerr, Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 22, 1970, Ser. No. 83,158
Int. Cl.² C07C 45/00, 37/08, 179/02
U.S. Cl. 260—586 R 2 Claims

1. A method of preparing phenol and cyclohexanone comprising first contacting a mixture of cyclohexylbenzene and a member selected from the group consisting of cumene and cumene hydroperoxide with an oxygen containing gas at a temperature between about 90° and 140°C. in an initial mole ratio of said cyclohexylbenzene to said member of between about 1:99 and 99:1, utilizing a mole ratio of oxygen to said cyclohexylbenzene of at least about 3:1 to form a second mixture of 1-phenylcyclohexyl hydroperoxide and cumyl hydroperoxide, and subsequently removing excess cumene and at least a portion of excess cyclohexylbenzene from said second mixture followed by second contacting said second mixture with an alkanone of from 3 to 6 carbons and an acid cleavage catalyst selected from the group consisting of hydrocarbyl sulfonic acid and mineral acid at a temperature between about 20° and 50°C. and recovering phenol and cyclohexanone from the final product, said catalyst being present in said second contacting in a concentration between about 10 and 30 wt. % based on the reaction mixture and said alkanone being present in said second contacting in a concentration of between about 20 to 80% based on the reaction mixture.

3,959,382

METHOD FOR REACTIVATING PALLADIUM CATALYSTS

Chuen Y. Yeh, Succasunna, and Harry E. Ulmer, Morris Township, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Nov. 26, 1974, Ser. No. 527,468
Int. Cl.[2] C07C *45/00*; B01D *15/06*
U.S. Cl. 260—586 P 12 Claims

1. A process for the reactivation of the spent palladium catalyst employed in the hydrogenation of reducible cyclic organic compound containing deleterious nitrogen impurities in a concentration of from about 1 to 5,000 ppm which comprises: separating the spent catalyst from the hydrogenation reaction mixture; and contacting said separated spent catalyst in a liquid reactivation medium at a temperature of at least about 150°C with a reactivating agent selected from the group consisting of alkali metal and alkaline earth metal bicarbonates, carbonates, nitrates, chlorides, fluorides, hydroxides and mixtures thereof to reactivate the catalyst.

3,959,383

TWO-STAGE CONVERSON OF METHANOL TO FORMALDEHYDE

Evan S. Northeimer, deceased, late of Charleston, W. Va. (by Margaret Northeimer, executrix), assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 742,989, April 16, 1968, which is a continuation-in-part of Ser. No. 465,975, June 22, 1965, abandoned. This application Mar. 7, 1974, Ser. No. 448,994
Int. Cl.[2] C07C *45/16*
U.S. Cl. 260—603 C 3 Claims

1. A two-stage process for the catalytic oxidation of methanol to formaldehyde comprising

a. passing a vapor mixture of methanol and air, wherein the air to methanol mole ratio is in the range of from 0.95 to 1.29, into a primary oxidizer containing a silver catalyst at a space velocity of from 100,000 to 500,000 reciprocal hours whereby oxidation of methanol to formaldehyde occurs at an adiabatic temperature in a range of from 575° to 650°C.;

b. cooling the effluent gases from said primary oxidizer to a temperature below 300°C.;

c. admixing additional air with said cool gases so that the total air to methanol on a mole basis for the process is in the range of from 1.90 to 2.40;

d. passing the resulting gaseous mixture into a secondary oxidizer at a space velocity of 250,000 to 600,000 reciprocal hours, said secondary oxidizer containing a catalyst bed having an average depth of from 0.5 to 1.5 inches of silver crystals having a size range of 8 to 40 screen mesh whereby further oxidation of methanol to formaldehyde occurs in an adiabatic temperature range of from 600° to 700°C.;

e. cooling the effluent gases from said secondary oxidizer to a temperature below 300°C.; and

f. passing said cooled gases resulting from step (e) to an absorber and collecting the condensed liquid product formed therein.

3,959,384

OXIDATION CATALYST AND PROCESS FOR OXIDATION OF OLEFINS TO UNSATURATED ALDEHYDES

Shigeo Takenaka; Yasuji Kido; Tatsutoshi Shimabara, and Masanobu Ogawa, all of Takasaki, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 125,796, March 18, 1971, abandoned, which is a division of Ser. No. 31,757, April 24, 1970, Pat. No. 3,778,386. This application Sept. 4, 1974, Ser. No. 503,093
Claims priority, application Japan, May 2, 1969, 44-33597
Int. Cl.[2] C07C *45/04*
U.S. Cl. 260—604 R 10 Claims

1. A process for increasing the single pass yield of unsaturated aldehydes in the oxidation of olefins to unsaturated aldehydes comprising reacting, in gaseous phase at a temperature of from 250° to 500°C at a pressure of from 0.5 to 10 atmospheres absolute, an olefin selected from the roup consisting of propylene and isobutylene a gas selected from the group consisting of air, oxygen and mixtures thereof in the presence of an oxidation catalyst of the general formula: $Ni_aCo_bFe_cBi$ hd $dB_eM_hMo_fO_g$; in which Ni, Co, Fe, Bi, B, Mo and O are respectively elements of nickel, cobalt, iron, bismuth, boron, molybdenum and oxygen; M is at least one element selected from the group consisting of potassium, rubidium and cesium; *a*, *b*, *c*, *d*, *e*, *f*, *g*, and *h* are respectively numbers of atoms of Ni, Co, Fe, Bi, B, Mo, O and M; and wherein *a* and *b* are 0 to 15, *a* plus *b* is 2 to 15, *c* is 0.5 to 7, *d* is 0.1 to 4, *e* is 0.5 to 4, *f* is 12, *g* is 35 to 85, and *h* is 0.01 to 0.5.

10. A process for increasing the single pass yield of unsaturated aldehydes in the oxidation of olefins to unsaturated aldehydes comprising reacting, in gaseous phase at a temperature of from 250° to 500°C at a pressure of from 0.5 to 10 atmospheres absolute, an olefin selected from the group consisting of propylene and isobutylene with a gas selected from the group consisting of air, oxygen and mixtures thereof in the presence of an oxidation catalyst of the general formula:

$Ni_aCo_bFe_cBi_dL_eM_hMo_fO_g$; in which Ni, Co, Fe, Bi, Mo and O are respectively elements of nickel, cobalt, iron, bismuth, molybdenum and oxygen; L is at least one element selected from the group consisting of phosphorous, arsenic and boron; M is at least one element selected from the group consisting of potassium, rubidium and cesium; *a*, *b*, *c*, *d*, *e*, *f*, *g*, and *h* are respectively numbers of atoms of Ni, Co, Fe, Bi, L, Mo, O and M; and wherein *a* and *b* are 0 to 15, *a* plus *b* is 2 to 15, *c* is 0.5 to 7, *d* is 0.1 to 4, *e* is 0 to 4, *f* is 12, *g* is 35 to 85, and *h* is 0.01 to 0.5.

3,959,385

PRODUCTION OF ALCOHOLS AND/OR ALDEHYDES

Hans Juergen Nienburg, Ludwigshafen; Wilhelm Kniese, Limburgerhof; Rudolf Kummer, Frankenthal, and Peter Tavs, Limburgerhof, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Oct. 15, 1970, Ser. No. 81,168
Claims priority, application Germany, Nov. 6, 1969, 1955828
Int. Cl.[2] C07C *45/08*
U.S. Cl. 260—604 HF 9 Claims

1. An improved process for the production of aldehydes and alcohols by the oxo process comprising reacting an aliphatic, cycloaliphatic or araliphatic olefinically unsaturated compound of up to 20 carbon atoms with carbon monoxide and hydrogen at a temperature of from 140° to 250°C and at a pressure of from 20 to 350 atmospheres in the presence of carbonyl complexes of metals in Group VIII of the Periodic Table modified by trisubstituted organic phosphines and in the presence of alkali or alkaline earth metal salts of carboxylic acids, the improvement which comprises using as the trisubsti-

tuted organic phosphine modifying agent a trisubstituted organic phosphine having the structural formula

$$R_p-P[(CH_2)_nCOOMe]_n$$

where R stands for methyl or ethyl, Me stands for potassium or sodium in at least a stoichiometric amount for a carboxyl group, *m* stands for an integer of from 8 to 14 inclusive, *n* stands for 1 to 3 inclusive, and *p* stands for 3-*n*.

3,959,386

PRODUCTION OF PRIMARY COMPOUNDS

Paul A. Pinke, Des Plaines, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 13, 1974, Ser. No. 469,162
Int. Cl.² C07C *27/22*
U.S. Cl. 260—604 HF **8 Claims**

1. A process for the preparation of a linear primary alkanol or alkanal which comprises reacting a monoolefinic hydrocarbon possessing from 3 to 21 carbon atoms in a hydrogen atmosphere with aluminum metal and a compound selected from the group consisting of triethyl aluminum and diisopropyl aluminum hydride at a temperature of from about 50°C to about 200°C and a pressure of from about 14 to 4000 psi to form a tri-n-alkyl aluminum compound, reacting said tri-n-alkyl aluminum compound with carbon monoxide and hydrogen at a temperature of from about 25°C to about 400°C and a pressure of from about 14 to about 4000 psi in the presence of a hydroformylation catalyst selected from the group consisting of bis-(tributyl phosphine) nickel chloride and triphenyl phosphine rhodium chloride and recovering the resultant linear primary alkanol or alkanal.

3,959,387

RECOVERY OF BROMINATED BIPHENYL OXIDE

David R. Brackenridge, Royal Oak, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 283,324, Aug. 24, 1972, Pat. No. 3,833,674. This application Aug. 30, 1974, Ser. No. 501,983
The portion of the term of this patent subsequent to Sept. 3, 1974, has been disclaimed.
Int. Cl.² C07C *41/00*
U.S. Cl. 260—612 R **4 Claims**

1. A process for preparing polybrominated biphenyl oxide having 8 to 10 bromine atoms per molecule, said process comprising reacting biphenyl oxide with bromine at a temperature of from room temperature to about 200°C in the presence of 0.001 to 0.1 moles of catalyst per mole of bromine, said catalyst selected from the class consisting of aluminum chloride, aluminum bromide, iron chloride, and iron bromide, and mixtures thereof, and in the presence of methylene bromide, as the reaction solvent, and subsequently treating the reaction mixture at reflux with methanol to precipitate polybrominated biphenyl oxide.

3,959,388

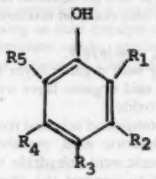
PREPARATION OF PHLOROGLUCINOL OR ITS MONOMETHYL ETHER

Nicolaas A. de Helj, Bierick, and Andreas J. J. Hendrickx, Venlo, both of Netherlands, assignors to Andeno B.V., Venlo, Netherlands

Continuation-in-part of Ser. No. 272,928, June 23, 1972. This application Dec. 12, 1973, Ser. No. 424,178
Int. Cl.² C07C *43/20*, *37/02*
U.S. Cl. 260—613 D **10 Claims**

1. A process for the preparation of phloroglucinol or its monomethyl ether which comprises:

1. reacting with alkali metal hydroxide at a temperature between 130° and 180° C in the initial absence of water, in an inert organic liquid medium which forms an azeotrope with water and with said hydroxide present in a molar ratio of between 5:1 and 12:1 to the amount of phenol present, a phenol of the formula:



wherein

R_1, R_3, R_4 and R_5, which may be the same or different, each represents a hydrogen atom or a halogen atom selected from the group consisting of chlorine and bromine atoms, and

R_2 represents a hydrogen atom, a said halogen atom or a group of the formula $—OR_6$, wherein R_6 represents a hydrogen atom or a methyl group;

with the proviso that:

i. when R_2 represents a said halogen atom or a group of the formula $—OR_6$, R_1 represents a hydrogen atom and only one of R_3, R_4 and R_5 represents a said halogen atom; and that

ii. when R_2 represents a hydrogen atom. two of R_1, R_3, R_4 and R_5 each represents a said halogen atom occupying a position on the benzene ring vicinal to at least one position thereon occupied by a hydrogen atom;

2. distilling off, as azeotrope, water produced by the reaction; and

3. acidifying the alkali metal salt of the tri-hydroxybenzene or monomethyl ether thereof so formed to produce the corresponding free tri-hydroxybenzene or monomethyl ether.

3,959,389

METHOD OF MANUFACTURING ALKYLENE OXIDE ADDUCTS OF AN ALIPHATIC ALCOHOL

Naoji Kurata, Nishinomiya; Kazuo Koshida, Ashiya; Toshihiro Fujii, Moriguchi; Koichi Matsuhiro, Achiya, and Yukio Okuda, Toyonaka, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Division of Ser. No. 271,685, July 14, 1972. This application Feb. 1, 1974, Ser. No. 438,531
Int. Cl.² C07C *41/02*, *41/10*
U.S. Cl. 260—615 B **8 Claims**

1. In a method of manufacturing alkylene oxide adducts of an aliphatic alcohol which comprises the steps of:

a. admixing an alkylene oxide having 2 to 4 carbon atoms with the aliphatic alcohol in the presence of an acid catalyst selected from the group consisting of sulfuric acid, phosphoric acid and Friedel-Crafts catalysts to form an addition reaction mixture and

b. distilling said reaction mixture to obtain an alcoholic distillate and a residue consisting essentially of an alkylene oxide adduct of the aliphatic alcohol;

wherein said aliphatic alcohol is obtained by the liquid phase oxidation of a saturated aliphatic hydrocarbon having 8 to 20 carbon atoms in the presence of a boron compound by contacting with a molecular oxygen containing gas;

the improvement comprising:

i. combining said method of manufacturing alkylene oxide adducts with a method of manufacturing the aliphatic alcohol employed in step (a) which method comprises the steps of:

a'. subjecting a saturated aliphatic hydrocarbon having 8 to 20 carbon atoms to oxidation by contacting said hydrocarbon with a molecular oxygen-containing gas in the liquid phase in the presence of a boron compound which is capable of forming a boric acid upon contact with water to form a reaction mixture containing a borate ester,

b'. contacting said reaction mixture with water at a temperature between 20° and 200°C to form an organic layer and an aqueous layer, the weight ratio of water to said reaction mixture being between 10:1 to 1:10,

c'. separating said layers,

d'. subjecting said organic layer to saponification by contacting said organic layer with an aqueous alkali metal hydroxide,

e'. adding a compound selected from the group consisting of orthoboric acid, metaboric acid, pyroboric acid and boric acid anhydride to the saponified organic layer to convert the alcohol in said organic layer into the corresponding borate ester,

f'. distilling the resulting mixture of step (e') to obtain a crude borate ester residue and a distillate consisting essentially of unreacted hydrocarbon and volatile by-product,

g'. recycling said distillate to oxidation step (a'),

h'. contacting said residue with water at a temperature between 20° to 200°C to form a second organic layer and a second aqueous layer, the weight ratio of water to said residue being between 10:1 to 1:10,

i'. separating said layers, and

j'. distilling said second organic layer to obtain a product consisting essentially of said aliphatic alcohol; and

ii. cycling 1 to 50% by weight of the distillate from step (b) of the method of manufacturing the alkylene oxide adducts to any of the steps (b'), (c'), (d'), (e') or (f') of the method of manufacturing the aliphatic alcohol.

3,959,390
PROCESS OF PRODUCING MONO AND POLYHYDROXYL ETHERS

Guy Vanlerberghe, Claye-Souilly, France, assignor to L'Oreal, Paris, France

Division of Ser. No. 307,523, Nov. 17, 1972, Pat. No. 3,840,606, which is a continuation of Ser. No. 882,719, Dec. 5, 1969, abandoned. This application July 1, 1974, Ser. No. 484,987

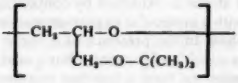
Claims priority, application Luxemburg, Dec. 9, 1968, 57504

Int. Cl.[2] C07C *41/00, 41/02*

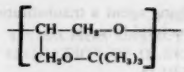
U.S. Cl. 260—615 R **3 Claims**

1. A process for preparing a member selected from the group consisting of polyhydroxyl ether and polyhydroxyl polyether consisting essentially of

a. heating at a temperature between 50°–120°C a corresponding ether selected from the group consisting of monoether and polyether, containing at least one oxyalkylene radical having the formula selected from the group consisting of



and



said corresponding ether being produced by reacting tertiobutyl glycidyl ether and a compound of the formula $R(XH)_a$ wherein *a* is an integer of 1–6, R is an aliphatic hydrocarbon having 1–30 carbon atoms, saturated or unsaturated, linear or branched and carrying 1–2 chloro substituents and X is O, the proportion of said tertiobutyl glycidyl ether to said compound expressed in moles of epoxide per gram atom of reactive hydrogen being 0.1 – 10, at a temperature of 80° – 180°C in the presence of a basic catalyst selected from the group consisting of alkali metal and the hydroxide, alcoholate and mercaptide thereof, present in amounts of 0.1 – 1 percent by weight of the reaction mass, the heating of said corresponding ether being carried out in the presence of a catalyst selected from the group consisting of benzene sulfonic acid, paratoluene sulfonic acid, sulfosalicylic acid, 3-hydroxy propane sulfonic acid, sulfoacetic acid, α-sulfolauric acid, α-sulfopalmitic acid and α-sulfostearic acid, said catalyst being present in amounts of about 0.5 – 20 percent by weight of said corresponding ether; and

b. progressively adding water to said corresponding ether and said catalyst being heated, in amounts of 10 – 200 percent by weight of said corresponding ether.

3,959,391
DIETHERS OF POLYALKYLENE GLYCOL

Ronald J. Allain, Brookhaven, Miss., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 346,220, March 29, 1973, abandoned. This application Apr. 11, 1975, Ser. No. 567,326

Int. Cl.[2] C07C *41/00*

U.S. Cl. 260—615 B **6 Claims**

1. In a modified Williamson process for the production of diethers from polyalkylene glycols using sodium hydroxide and a lower alkyl halide as reactants both in molar amounts ranging from 100–120% of theoretical values at a temperature of 100°–130°C and a pressure from atmospheric to about 50 psig in a main reaction and separating out the aqueous layer of sodium chloride, the improvement which comprises increasing the yield of the diether product from about 70% to at least 95% by then adding after said separation of the aqueous layer of sodium chloride an additional quantity of said sodium hydroxide and said alkyl halide each in the amount of about 20 –25% of theoretical and concurrently removing water of formation in a supplemental reaction which is carried out at a temperature of 105°–135°C and at a pressure from atmospheric to about 50 psig.

3,959,392
PROCESS FOR PREPARING CHLOROHYDROQUINONE

Norbert Szczepanski, and Konrad Baessler, both of Frankfurt am Main, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 19, 1974, Ser. No. 525,182

Claims priority, application Germany, Nov. 24, 1973, 2358623

Int. Cl.[2] C07C *39/08, 39/28*

U.S. Cl. 260—621 H **9 Claims**

1. Process for preparing chlorohydroquinone by adding hydrogen chloride to p-benzoquinone, which comprises treating a 1 to 20% by weight solution of p-benzoquinone in benzene with hydrogen chloride at a hydrogen chloride pressure of from 1 to 6 atmospheres gauge and a temperature of from 40° to 80°C, the residence time being of from 1 to 4 hours, and isolating the chlorohydroquinone.

3,959,393

PREPARATION OF 1,2-DIHYDROXY COMPOUNDS

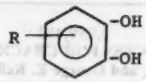
Richard D. Smetana, Beacon, N.Y., assignor to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 818,779, April 23, 1969. This application Aug. 4, 1975, Ser. No. 601,777

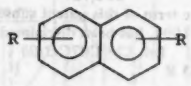
Int. Cl.² C07C *39/06, 39/08*

U.S. Cl. 260—621 G 3 Claims

1. A method of preparing a dihydroxybenzene compound of the formula:



where R is hydrogen or primary alkyl of from 1 to 10 carbons comprising first contacting under substantially anhydrous conditions a naphthalene compound of the formula:



where R is as heretofore defined with ozone and a mixture of first mineral acid and alkanoic acid of from 2 to 10 carbons at a temperature of about 10°C. utilizing a mole ratio of said naphthalene compound to ozone of between about 1:1 and 1:3, said naphthalene compound to alkanoic acid of between about 1:1 and 1:100 and said naphthalene compound to said mineral acid of between about 100:1 and 1:1 to form an acyloxybenzene intermediate and hydrolyzing said intermediate with an aqueous solution of an agent selected from the group consisting of a second mineral acid and inorganic base to form said dihydroxybenzene.

3,959,394

PROCESS FOR SELECTIVE METHYLATION OF PHENOLS

Akira Tasaka, Takatsuki; Akio Fukui, Ibaragi; Akira Morii, and Masahiro Fujiwara, both of Takatsuki, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

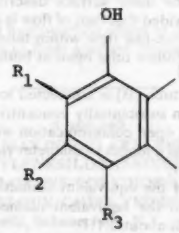
Continuation of Ser. No. 369,003, June 11, 1973, abandoned. This application Sept. 4, 1975, Ser. No. 610,186

Claims priority, application Japan, June 12, 1972, 47-58788

Int. Cl.² C07C *37/16*

U.S. Cl. 260—621 R 16 Claims

1. In a process for selective methylation in the ortho position of a phenol represented by the formula:



wherein each of R_1, R_2, R_3 and R_4 which may be the same or different represents a hydrogen atom or a saturated aliphatic hydrocarbon group having 1 to 6 carbon atoms, comprising reacting at a pressure atmospheres about 0.5 to 20 atomspheres the phenol with methanol in a molar ratio of phenol to methanol of 1:1–15 in the vapor phase at a gas space velocity of 100 to 2000 hr^{-1} and at an elevated temperature between 300° to 500°C in the presence of a catalyst, the improvement which comprises using as said catalyst a catalyst containing cerium oxide, magnesium oxide, germanium oxide and tin oxide in a ratio by weight of CeO_2:MgO:SnO_2:GeO_2=1:0.01–2:0–2:0.01–2.

3,959,395

RECOVERY OF POLYMERIZATION INHIBITOR

Thomas D. Higgins, Jr., Texas City, and Raymond A. Newsom, Dickinson, both of Tex., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 26, 1974, Ser. No. 536,271

Int. Cl.² C07C *79/24, 37/28*

U.S. Cl. 260—622 R 5 Claims

1. The process for recovery of dinitrophenol inhibitors from styrene tar which comprises the steps of:
   1. intimately contacting styrene tar containing dinitrophenol inhibitor at a temperature between about 70° and about 95°C with an aqueous solution of the hydroxide of an alkali metal or ammonia while controlling the pH of the aqueous phase between about 5 and 10,
   2. separating the resulting liquid phases,
   3. intimately contacting the separated aqueous phase simultaneously with a mineral acid and an organic solvent for dinitrophenol selected from the group consisting of ethylbenzene and mixtures of ethylbenzene, styrene, toluene and benzene while controlling the pH of the aqueous phase below 3, and
   4. recovering the organic phase containing substantially all the dinitrophenol dissolved therein.

3,959,396

UNSATURATED ALCOHOLS AND PERFUME COMPOSITIONS CONTAINING SAME

Paul Ochsner, Geneva, and Bruno Peter Vaterlaus, Binningen, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

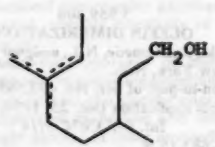
Continuation of Ser. No. 657,501, Aug. 1, 1967, abandoned. This application Sept. 19, 1973, Ser. No. 398,887

Claims priority, application Switzerland, Aug. 3, 1966, 11292/66

Int. Cl.² C07C *33/02*; C11B *9/00*

U.S. Cl. 260—632 R 6 Claims

1. A racemic compound having the formula



wherein

the dotted lines indicate that one double bond emanates from the 6-position, or mixtures of two or more of said compounds.

3,959,397

STABILIZATION OF 1,1,1-TRICHLOROETHANE WITH A THREE COMPONENT SYSTEM

Hermann Richtzenhain, Much-Schwellenbach, and Rudolf Stephan, Troisdorf-Sieglar, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Continuation-in-part of Ser. No. 60,173, June 29, 1970, Pat. No. 3,787,509, which is a division of Ser. No. 805,923, Jan. 5, 1969, Pat. No. 3,590,088, which is a division of Ser. No. 609,681, Jan. 16, 1967, Pat. No. 3,445,532, which is a continuation of Ser. No. 316,772, Oct. 16, 1963, abandoned. This application Oct. 23, 1973, Ser. No. 408,955

Claims priority, application Germany, Oct. 18, 1962, 4008712

Int. Cl.² C07C *17/42, 19/02*

U.S. Cl. 260—652.5 R **2 Claims**

1. A stabilized 1,1,1-trichloroethane composition consisting essentially of 1,1,1-trichloroethane and 0.1 to 1.0 wt. % methoxyacetonitrile, 0.5 to 3.0 wt. % 1,4-dioxane and 0.2 to 1.0 wt. % nitromethane.

3,959,398

ALPHA-METHYL-P-BROMO-STYRENE AND METHOD OF PREPARATION

George Jalics, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 3, 1974, Ser. No. 475,711

Int. Cl.² C07C *17/02*

U.S. Cl. 260—650 R **5 Claims**

1. A method of preparing α-methyl-p-bromo-styrene which comprises the sequential steps of obtaining a chlorinated aliphatic hydrocarbon solvent solution of poly(α-methyl-styrene) having a molecular weight in the range of about 1,000 to about 200,000; brominating said polymer with liquid or gaseous bromine at a temperature in the range of about 20° to about 100°C; and depolymerizing said brominated polymer by heating to a temperature in the range of about 250° to about 500°C.

3,959,399

MONO-ALKYLATION OF NAPHTHALENE

B. W. Bridwell, and Carl E. Johnson, both of Brookhaven, Miss., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Feb. 19, 1975, Ser. No. 551,431

Int. Cl.² C07C *3/54*

U.S. Cl. 260—671 C **4 Claims**

1. In a process of making mono- and polyalkyl naphthalenes by a reaction under anhydrous conditions in the liquid phase at moderate temperatures and at atmospheric pressure by reacting naphthalene with an α alkene having a carbon chain length of C_4–C_{16} in the presence of a protonic acid catalyst, the improvement which consists of inhibiting the production of polyalkyl naphthalenes by utilizing a mixed protonic acid catalyst consisting of an alkane sulfonic acid and an active P_2O_5 containing acid catalyst utilized in a ratio of about 2:1 to 1:2 in weight percent of sulfonic acid:P_2O_5 containing acid catalyst.

3,959,400

OLEFIN DIMERIZATION

Stanley J. Lucki, Runnemede, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 402,565, Oct. 1, 1973, abandoned. This application Dec. 23, 1974, Ser. No. 535,543

Int. Cl.² C07C *3/14*

U.S. Cl. 260—683.15 R **11 Claims**

1. In a method for dimerization of an olefin feed of 2 to 4 carbon atoms which comprises contacting said olefin under olefin dimerization conditions including a temperature of from about 32°F to about 350°F, a pressure of from about 200 psig to about 1000 psig and an olefin weight hourly space velocity of from about 0.1 to about 10 with a catalyst of alumina selected from the group consisting of gamma alumina, eta alumina and a mixture thereof having intimately combined therewith nickel and sulfur as a result of impregnation with nickel sulfate, the improvement wherein said catalyst of alumina has intimately combined therewith from about 2 to about 5 weight percent nickel and from about 1 to about 3 weight percent sulfur, and has been calcined at a temperature of from 750°F to about 1150°F in an inert non-reducing atmosphere.

3,959,401

PROCESS FOR CRACKING

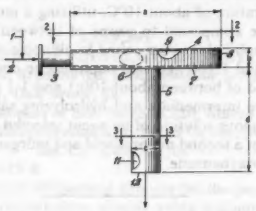
Charles W. Albright, and George E. Keller, II, both of South Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 359,675, May 14, 1973, abandoned, which is a continuation-in-part of Ser. No. 252,511, May 8, 1972, abandoned. This application Dec. 13, 1974, Ser. No. 532,727

The portion of the term of this patent subsequent to Nov. 19, 1991, has been disclaimed.

Int. Cl.² C07C *3/08*

U.S. Cl. 260—683 R **7 Claims**



1. A process for cracking hydrocarbon feedstocks consisting essentially of introducing a mixture of feedstock and hot gas into a reactor in which cracking temperatures are maintained, said reactor comprising:

A. a hollow cylindrical tube having (i) a first end closure and a second end closure, at least one of said end closures being provided with an orifice disposed substantially centrally therein; and (ii) at least one hollow inlet feed chamber open at both ends passing through the cylindrical surface described by tube (A), one end of said feed chamber being disposed in the interior of the tube at about its periphery in such a manner that vapor, which is passed through said chamber, will flow substantially tangentially to the inner surface described by cylindrical tube (A), provided that rate of flow is sufficient therefor, creating a vortex-like flow within tube (A); and

B. at least one hollow tube open at both ends;

wherein:

a. one end of tube (B) is connected to tube (A) at about its orifice in substantially concentric alignment therewith and in open communication with tube (A);

b. tube (A) has a length to diameter ratio of about 0.01:1 to about 1:1,

c. the ratio of the equivalent diameter of the orifice of tube (A) to the equivalent diameter of tube (B) is about 1:1 to about 0.1:1;

d. tube (B) has a length to equivalent diameter of about 5:1 to about 200:1; and

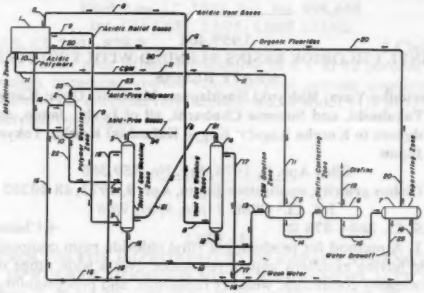
e. the ratio of the volume of tube (A) to the volume of tube (B) is about 0.1:1 to about 5:1;

quenching the effluent from the reactor, and recovering the products of cracking.

3,959,402
SEPARATION OF HF FROM POLYMER, CONSTANT BOILING MIXTURE RELIEF GASES AND VENT GASES IN ALKYLATION PROCESS

Michael Z. Mikulicz, Palatine; William G. Boney, Rolling Meadows, and Bipin V. Vora, Burrallo Grove, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 11, 1974, Ser. No. 531,514
Int. Cl.² C07C *3/54*
U.S. Cl. 260—683.48 **3 Claims**



1. In a hydrogen-fluoride-catalyzed alkylation process wherein polymer is formed during said process and wherein a constant boiling mixture of HF and water, relief gases containing HF and vent gases containing HF are collected during said process, the method of recovering hydrogen fluoride from said polymer, said constant boiling mixture and said gases comprising:

a. separately washing said gases with water streams to absorb HF into the water;

b. stripping HF from hydrogen fluoride catalyst and removing said polymer as bottoms from said stripping step;

c. washing said polymer with water to absorb HF into the water;

d. commingling the water streams of step (a) and the wate from step (c) with said constant boiling mixture;

e. adding a mono-olefin to the resultant mixture of step (d) to react said mono-olefin with the hydrogen fluoride therein to form organic fluoride;

f. separating the reaction mixture of step (e) into an aqueous phase and a hydrocarbon phase containing organic fluoride, and

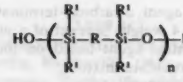
g. supplying said hydrocarbon phase to the alkylation zone of said process to form alkylate product therein.

3,959,403
PROCESS FOR MAKING SILARYLENESILANEDIOL, SILARYLENESILOXANEDIOL AND SILARYLENESILOXANE-POLYDIORGANOSILOXANE BLOCK COPOLYMERS

Ronald W. Lakochelle, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

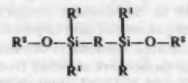
Filed Mar. 31, 1975, Ser. No. 563,784
Int. Cl.² C08L *83/00*
U.S. Cl. 260—825 **20 Claims**

1. A method for making silarylenesiloxane of the formula



which method comprises

1. agitating a mixture consisting essentially of a dialkoxysilarylene of the formula



water, and a water miscible organic solvent at a temperature in the range of about 0° to 100°C, and thereafter

2. stripping the mixture of (1) of volatiles under reduced pressure to a temperature of up to about 100°C

where *n* is an integer equal to 1 to 100 inclusive, R is a divalent aromatic organic radical, R_1 is a monovalent organic radical and R^2 is a $C_{(1-8)}$ alkyl radical.

3,959,404
POWDER COATING COMPOSITIONS CONTAINING GLYCIDYL ESTER COPOLYMERS AND PHENOLIC HYDROXY TERMINATED CROSSLINKING AGENT

Santokh S. Labana, Dearborn Heights, and Ares N. Theodore, Farmington, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 172,225, Aug. 16, 1971, Pat. No. 3,787,520. This application Dec. 18, 1973, Ser. No. 425,742
The portion of the term of this patent subsequent to Jan. 22, 1991, has been disclaimed.
Int. Cl.² C08L *63/00*
U.S. Cl. 260—830 TW **20 Claims**

1. A powder coating composition which, exclusive of pigments and other non-reactive components, comprises a coreactable mixture of:

A. a copolymer of about 8 to about 30 weight percent of a glycidyl ester of a monoethylenically unsaturated acid and about 92 to about 70 weight percent of other monoethylenically unsaturated monomers, said copolymer having a glass transition temperature in the range of 40° to 90°C and a molecular weight (M_n) in the range of 2500 to 8500; and

B. a phenolic hydroxy terminated compound in the amount of about 0.8 to about 1.2 phenolic hydroxy groups for each epoxy group in the copolymer.

3,959,405
POWDER COATING COMPOSITIONS COMPRISING A BLEND OF COREACTIVE POLYMERS - III

Santokh S. Labana, Dearborn Heights, and Ares N. Theodore, Farmington, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1973, Ser. No. 426,164
Int. Cl.² C08L *63/10*
U.S. Cl. 260—836 **2 Claims**

1. In a thermosettable powder paint which exclusive of pigments, catalysts, antistatic agents, and plasticizers, the same being conventional non-reactive additives to a thermosettable powder paint, consists essentially of a coreactable particulate mixture of

A. an epoxy-functional copolymer of monoethylenically unsaturated monomers consisting essentially of about 5 to about 20 weight percent of a glycidyl ester of a monoethylenically unsaturated carboxylic acid and about 80 to about 95 weight percent of other monoethylenically unsaturated monomers, and having a glass transition temperature in the range of about 40°C. to about 90°C. and a molecular weight in the range of about 1500 to about 15,000,

B. as crosslinking agent, a carboxy-terminated polymer, and

C. 0.05 to about 4 weight percent of a non-reactive polymeric flow control agent based on the weight of said coreactable particulate mixture,

the improvement wherein:

1. said epoxy-functional copolymer is qualitatively difunctional and said other monoethylenically unsaturated monomers consist essentially of difunctional monomers selected from the group consisting of acrylamide and methacrylamide in an amount comprising about 2 to about 10 weight percent of said copolymer and monoethylenically unsaturated monomers consisting essentially of monofunctional monomers selected from the group consisting of esters of a C_1–C_8 monohydric alcohol and acrylic acid, esters of a C_1–C_8 monohydric alcohol and methacrylic acid and C_8–C_{12} monovinyl hydrocarbons, and

2. said carboxy-terminated polymer has molecular weight in the range of about 1500 to about 15,000 and is a copolymer of about 5 to about 20 weight percent of an alpha-beta olefinically unsaturated monocarboxylic acid selected from acrylic and methacrylic acid and about 80 to about 95 weight percent of alpha-beta monoethylenically unsaturated monomers consisting essentially of monofunctional monomers selected from the group consisting of esters of a C_1–C_8 monohydric alcohol and a monocarboxylic acid selected from acrylic acid and methacrylic acid, and C_8–C_{12} monovinyl hydrocarbons, said esters of a C_1–C_8 monohydric alcohol and a monocarboxylic acid selected from acrylic acid and methacrylic acid comprising in excess of 50 weight percent of said carboxy-terminated polymer, and is present in said coreactive particulate mixture in an amount that provides about 0.4 to about 1.4 carboxyl groups per functional group on said epoxy-functional copolymer.

3,959,406

POLYELECTROLYTE COMPOSITE OF POLYVINYL ALCOHOL DERIVATIVES

Waichiro Tsuji, Kyoto; Akio Nakajima, Ikeda, and Masao Hosono, Hirakata, all of Japan, assignors to Kyoto University, Kyoto, Japan

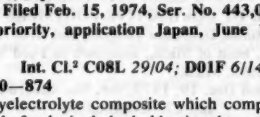
Filed Feb. 15, 1974, Ser. No. 443,095

Claims priority, application Japan, June 12, 1973, 48-066004

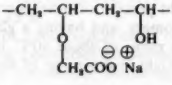
Int. Cl.² C08L *29/04*; D01F *6/14*

U.S. Cl. 260—874 **3 Claims**

1. A polyelectrolyte composite which comprises a partial aminoacetal of polyvinyl alcohol having the repeating units of



and a carboxymethyl polyvinyl alcohol having the repeating units of



3,959,407

THERMOPLASTIC RESIN COMPOSITION

Toshiro Koshida, Kobe, and Yasuo Nakagawa, Nishinomiya, both of Japan, assignors to Sumitomo Bakelite Company, Limited, Tokyo, Japan

Filed Mar. 13, 1974, Ser. No. 450,905

Claims priority, application Japan, Mar. 17, 1973, 48-30523; Sept. 19, 1973, 48-104957

Int. Cl.² C08L *51/04*

U.S. Cl. 260—876 R **8 Claims**

1. A vinyl chloride polymer composition comprising 40–50% by weight of a vinyl chloride-propylene copolymer and 60–50% by weight of a quadripolymer of acrylonitrile, butadiene, methyl methacrylate and styrene, said quadripolymer having a heat deformation temperature of 80°to 100°C.

3,959,408

VINYL CHLORIDE RESINS BLENDED WITH TWO STEP GRAFT RESINS

Haruhiko Yusa; Hideyuki Hashizume; Masanori Oota; Kazuo Takahashi, and Susumu Chubachi, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 9, 1974, Ser. No. 459,360

Claims priority, application Japan, Apr. 9, 1973, 48-40202

Int. Cl.² C08L *51/04*, *9/04*, *9/08*

U.S. Cl. 260—876 R **4 Claims**

1. A method for producing a vinyl chloride resin composition having excellent impact resistance over a wide range of processing conditions, weather resistance, and processability, which comprises blending 95 to 70 parts by weight of a vinyl chloride resin and 5 to 30 parts by weight of a multicomponent resin, said multicomponent resin being a two-step graft polymerizate prepared by (1) graft-polymerizing 45 to 10 parts by weight of a monomer mixture comprising 10 to 50% by weight of acrylonitrile and 50 to 90% by weight of a member selected from the group consisting of methyl methacrylate, styrene, and mixtures of methylmethacrylate and styrene, containing 0.01 to 3% by weight of a cross-linking agent copolymerizable therewith onto a latex containing 50 to 80 parts by weight of a cross-linked rubber copolymer obtained by emulsion-polymerization of a monomer mixture comprising 40 to 95% by weight of an alkyl acrylate having from 2 to 12 carbon atoms in the alkyl radical, 5 to 40% by weight of butadiene, 0 to 30% by weight of methyl methacrylate and 0.01 to 3% by weight of a cross-linking agent copolymerizable therewith and then (2) graft-polymerizing 5 to 25 parts by weight of an alkyl methacrylate having from 1 to 4 carbon atoms in the alkyl radical containing 0.01 to 3% by weight of a cross-linking agent copolymerizable therewith onto the product of the first step.

3,959,409

PROCESS FOR THE PRODUCTION OF CRYSTALLINE PROPENE-ETHENE-BUTENE-1 TERPOLYMERS

Albert Frese; Fritz Baxmann; Walter Dittmann, and Johann Dietrich, all of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Oct. 16, 1974, Ser. No. 515,334

Claims priority, application Germany, Oct. 23, 1973, 2352980

Int. Cl.² C08F *297/08*, *210/08*, *210/16*

U.S. Cl. 260—878 B **10 Claims**

1. A low pressure polymerization process for the production of crystalline propene-ethene-butene-1 terpolymers containing 0.2–15% by weight ethene and 0.2–5% by weight butene-1, which comprises:

polymerizing propene with 0.2–10% by weight ethene and 0.1–2.5% by weight butene-1, based on the propene, in the liquid phase with a mixed polymerization catalyst suspension consisting essentially of a) a titanium chloride component of the formula $TiCl_3$ or $TiCl_3 \cdot n\ AlCl_3$

wherein n = 0.2–0.6 and b) a chlorine-containing organoaluminum compound in an Al:Ti molar ratio of 1.1–3.0 in a polymerization solvent consisting essentially of butene-2 or a C_4-cut containing 20-99% by weight butene-2 to form said crystalline terpolymers.

3,959,410
BUTADIENE GRAFTED ETHYLENE-VINYL ACETATE HOT MELT ADHESIVE

Raymond R. DiRossi, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 12, 1974, Ser. No. 496,610
Int. Cl.² C08L 23/26; C08F 255/02
U.S. Cl. 260—878 R **2 Claims**

1. A hot melt adhesive consisting of a 1 to 12 percent by weight butadiene grafted ethylene-vinyl acetate copolymer wherein the ethylene/vinyl acetate ratio is about 91/9 to 72/28 percent by weight.

3,959,411
PROCESS FOR IMPROVEMENT OF IMPACT STRENGTH IN RUBBER-MODIFIED NITRILE THERMOPLASTICS

June T. Duke, Chagrin Falls; B. Frank Vincent, Jr., Chesterland; Bruce O. Budinger, Cleveland, and James L. O'Kane, Warrensville Heights, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Oct. 31, 1973, Ser. No. 411,358
Int. Cl.² C08L 9/00, 9/06
U.S. Cl. 260—880 R **5 Claims**

1. The process for preparing resins having improved impact resistance comprising polymerizing in an aqueous emulsion 100 parts by weight of

A. from 70 to 90% by weight of at least one nitrile having the structure

wherein R represents hydrogen, a lower alkyl group, and a halogen, and

B. from 10 to 30% by weight based on the combined weights of (A) and (B) of a monovinyl aromatic monomer

in the presence of from 1 to 40 parts by weight of

C. a rubbery polymer of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and optionally at least one comonomer selected from the group consisting of styrene and a nitrile having the structure

wherein R has the foregoing designation, said rubbery polymer containing from 50 to 100% by weight of polymerized conjugated diene and correspondingly 0 to 50% by weight of the comonomer, said rubbery polymer being in the form of an aqueous latex wherein

(C) is at least partially swollen by from 1 to 50% by weight of (A) or (A) plus (B) with gentle mixing of only the (A) or (A) plus (B) components and allowing the mixed components to stand for at least 40 minutes prior to the polymerization reaction and wherein the remaining (A) or (A) plus (B) components are added continuously during the course of the polymerization.

3,959,412
BLOCK POLYMER PREPARATION

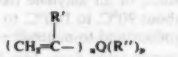
Lyman M. Oberlin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 10, 1973, Ser. No. 423,458
Int. Cl.² C08L 9/06
U.S. Cl. 260—880 B **18 Claims**

1. A process of block copolymerization comprising (a) polymerizing under polymerization condition employing a hydrocarbylmonoalkali metal-based initiator at least one first polymerizable monomer until substantial completion of conversion, thereby preparing a block polymer containing a polymer-alkali metal moiety on the end thereof, (b) coupling the resulting block polymer from said step (a) with a coupling agent containing at least two reactive groups capable of reacting with said polymer-alkali metal moiety of said block polymer without terminating the activity thereof, (c) adding to the reaction mixture resulting from said coupling step (b) without termination thereof at least one second polymerizable monomer differing from said first polymerizable monomer and continuing said polymerization under polymerization conditions, until substantial completion of conversion,

wherein each said polymerizable monomer is a polymerizable conjugated diene or a polymerizable monovinyl-substituted aromatic compound, wherein said hydrocarbylmonoalkali metal-based initiator is employed in a range of about 0.25 to 100 mhm, gram millimoles per 100 grams of total monomers employed, and said alkali metal is selected from the group consisting of lithium, sodium, potassium, rubidium, and cesium,

and wherein said coupling agent is



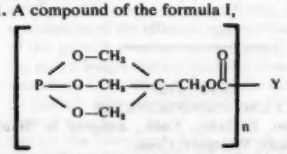
wherein R′ is hydrogen or an alkyl radical of up to 4 carbon atoms, R″ is a monovalent hydrocarbyl radical of up to 12 carbon atoms, *n* is an integer of 2–4 inclusive, p is 0 or an integer of 1–4 inclusive, such that $n + p =$ the valence of Q, wherein Q is silicon, ton, or phosphorus.

3,959,413
BICYCLIC PHOSPHITES

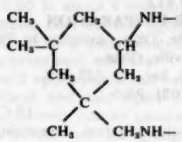
Kurt Schwarzenbach, Pfeffingen, Switzerland; Bernard Gilg, Saint-Louis, France; Heimo Brunetti, Reinach, and Helmut Müller, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 27, 1974, Ser. No. 483,592
Claims priority, application Switzerland, July 18, 1973, 10478/73
Int. Cl.² C07C 9/15
U.S. Cl. 260—927 R **3 Claims**

1. A compound of the formula I,



characterised in that *n* denotes 1 or 2, Y denotes, if *n* is equal to 1, alkylamino with 1–18 carbon atoms, cyclohexylamino, benzylamino, anilino, chloroanilino, dichloroanilino, alkylanilino with 7–10 carbon atoms or naphthylamino, or, if *n* is equal to 2, alkylenediamino with 2–9 carbon atoms, phenylenediamino, toluylenediamino, naphthylenediamino, diphenylmethane-4,4′-diamino or the radical



3,959,414

METHOD OF PREPARING STABLE CONDENSATION PRODUCTS USING A WATER-ALKYLENE OXIDE TREATMENT AND PRODUCTS THEREFROM

Kyung S. Shim, Irvington, and Edward N. Walsh, New City, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed May 28, 1974, Ser. No. 473,468
Int. Cl.² C07F 9/08
U.S. Cl. 260—928 7 Claims

1. A process for forming a stabilized condensation product, which is adapted to be incorporated in a polyurethane foam, derived from condensing a β-haloalkyl ester of a pentavalent phosphorus acid with itself or with an alkyl ester of a pentavalent phosphorus acid to form a condensation product which comprises treating said condensation product after residual acidity has been neutralized with from about 0.3% to 10%, by weight of said product, of water for about 2 to 4 hours at about 50° to 100°C and thereafter with about 0.1% to about 10%, by weight of said product, of an alkylene oxide for about 1 to about 10 hours at about 90°C. to 140°C. to open labile groups contained in the product and to neutralize those groups.

3,959,415

METHODS OF PREPARING STABLE CONDENSATION PRODUCTS AND PRODUCTS THEREFROM USING AN ALKYLENE OXIDE TREATMENT

Kyung S. Shim, Irvington, and Edward N. Walsh, New City, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed May 28, 1974, Ser. No. 473,469
Int. Cl.² C07F 9/08
U.S. Cl. 260—928 7 Claims

1. A process for forming a stabilized condensation product, which is adapted to be incorporated in a polyurethane foam, derived from condensing a β-haloalkyl ester of a pentavalent phosphorus acid with itself or with an alkyl ester of a pentavalent phosphorus acid to form a condensation product which comprises treating said condensation product with from about 1% to about 10%, by weight based on the weight of the condensation product of an alkylene oxide for from about 2 to about 12 hours at a temperature of about 90°C. to about 140°C. after residual acidity has been neutralized to open labile groups contained in the product and to neutralize those groups.

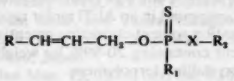
3,959,416

CYANO PHOSPHONATES

Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 298,979, Oct. 19, 1972, Pat. No. 3,862,999, which is a division of Ser. No. 123,467, March 11, 1971, abandoned. This application Nov. 18, 1974, Ser. No. 524,683
Int. Cl.² C07F 9/40; A01N 9/36
U.S. Cl. 260—940 8 Claims

1. Compounds corresponding to the formula



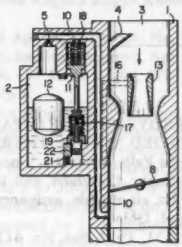
wherein R is selected from the group consisting of hydrogen, alkyl and aryl; R_1 is alkyl; R_2 is selected from alkylcyano and arylcyano; X is oxygen, sulfur or amino.

3,959,417

CARBURETOR

Hidenori Tateno, Nagoya; Takanori Nagai, Toyota, and Sadao Kurosaka, Nagoya, all of Japan, assignors to Toyota Judosha Kogyo Kabushiki Kaisha, Toyota, Japan and Toyota Motor Sales Company, Limited, Nagoya, Japan

Filed Feb. 25, 1974, Ser. No. 445,424
Claims priority, application Japan, July 14, 1973, 48-78911
Int. Cl.² F02M 5/08
U.S. Cl. 261—39 B 6 Claims



1. In a carburetor having a housing defining a float chamber for receiving fuel therein and a movable float associated with said chamber for controlling the quantity of fuel in said chamber, an intake pipe adapted to receive air therein and supply an air-fuel mixture to an engine, fuel supply passage means connecting said chamber to said intake pipe at a location upstream of the carburetor throttle valve for supplying fuel to said intake pipe, and a power jet system responsive to engine load for supplying additional fuel to said intake pipe, said power jet system including a negative pressure passage communicating at one end thereof with said intake pipe at a location downstream of the throttle valve, said power jet system also including actuator means associated with the other end of said negative pressure passage and movable in response to the pressure within said passage, the improvement comprising means for removing vaporized fuel from the upper part of said float chamber, said last-mentioned means including a communicating passageway connecting said negative pressure passage to the upper part of said float chamber at a location above the liquid level of the fuel, said communicating passageway having throttle means associated therewith for controlling the rate of flow therethrough, whereby the negative pressure created within said negative pressure passage sucks the vaporized fuel from the upper part of said float chamber and discharges same into said intake pipe at a location downstream of the throttle valve.

3,959,418

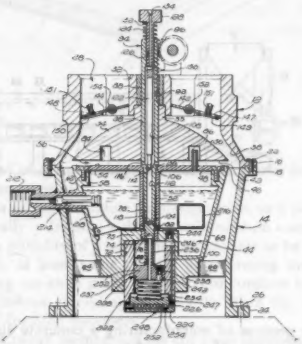
CARBURETOR

Francis Sullivan, Thousand Oaks, Calif., assignor to James T. Scott, Chatsworth, Calif., a part interest

Filed May 8, 1975, Ser. No. 575,827
Int. Cl.² F02M 9/06; F02M 17/02
U.S. Cl. 261—50 R 4 Claims

1. A carburetor comprising:

a mixture outlet and a connection means to attach said mixture outlet to an intake manifold;
a main air intake spaced from said mixture outlet, said main air intake including a butterfly valve adjustable to control the flow of air into said carburetor;
a fuel inlet;
a pair of spaced apart surfaces forming a fuel path from a central portion of said spaced apart surfaces to the periphery of said surfaces, said periphery of said surfaces being adjacent to the carburetor passageway for enabling the air from the main air inlet to mix with said fuel and pass to said intake manifold;
a central fuel inlet forming a path for fuel from a carburetor fuel resevoir to said surfaces central portion comprising an elongated axially movable tube whose outer surfaces taper; and
a cylindrical member whose inner surface surrounds said elongated tube outer surface, said tube and said cylindrical member when spaced apart defining a main fuel path from said fuel resevoir to said central portion of said surfaces;
a secondary inlet forming an air intake passageway when said inlet is closed, said secondary air inlet being defined by a bore formed in the interior of said elongated tube and extending from the carburetor exterior adjacent to the main air intake to the central portion of said surfaces;
a secondary fuel inlet forming a fuel inlet passageway for mixing with air in said secondary air inlet comprising a second bore in said elongated tube and extending from said fuel resevoir to said central portion of said surfaces; and
an orifice communicating with said bores and said central portion; and
a needle moving with respect to said elongated tube in said first bore for adjusting the flow of the air-fuel mixture in the orifice.

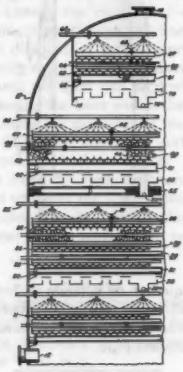


3,959,419
VAPOR-LIQUID CONTACT METHOD

Bedford L. Kitterman, Lakewood Village, Tex., assignor to Fritz W. Glitsch & Sons, Inc., Dallas, Tex.

Filed Sept. 6, 1973, Ser. No. 394,838
Int. Cl.² B01D *47/16*; F02M *17/28*
U.S. Cl. 261—98 **2 Claims**

1. A method for effecting vapor-liquid contact reactions between and ascending vapor and a descending liquid in a situation where the process conditions and the nature of the vapor and liquid are such that the vapor rate of the vapor decreases as it ascends, said method comprising:
passing vapor upwardly through a composite vapor-liquid contact zone having two contiguous regions, the lower of said regions having good efficiency at high vapor rates and the upper of said regions having good efficiency at low vapor rates, the interface between said regions being located to encounter ascending vapor having a vapor rate at which the efficiencies of said regions are substantially equal;
passing liquid downwardly through said composite zone to effect contact with vapor ascending therethrough;
and collecting and withdrawing at least part of the liquid passing out of said composite zone;



said lower region being formed of multiple layers of vapor-liquid contact grid, each layer comprising a plurality of relatively narrow elongate vertically oriented flanged ribs extending transversely of the path of fluid flow and generally parallel to one another and at an angle to ribs in other layers, the flanged ribs in a given layer being connected together by connecting means extending therebetween, and the flanges on said ribs extending generally transversely of the path of fluid flow;
and said upper region being formed of randomly oriented bulk packing, said packing being supported by said grid at the interface therebetween.

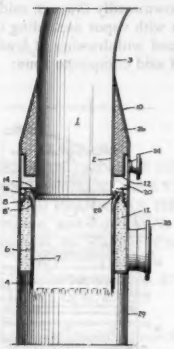
3,959,420
DIRECT QUENCH APPARATUS

Ray L. Geddes, Fort Myers, Fla., and Harry D. Robinson, Jr., Abington, Mass., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Filed May 23, 1972, Ser. No. 255,970
Int. Cl.² B01F *3/04*
U.S. Cl. 261—112 **12 Claims**

1. An apparatus for direct quench of pyrolysis gases issuing from a pyrolysis effluent pipe comprising:
a quench chamber arranged in series alignment following the pyrolysis effluent pipe, which quench chamber is configured in cross-section uniformly in the shape of the termination of the effluent pipe and the inside dimensions of the quench chamber are uniformly larger throughout the entire length thereof than the dimension of the inside diameter of the effluent pipe by the thickness of the layer of quench oil used to flow down the quench chamber inner wall;
a ring on the entry end of the quench chamber extending upwardly and outwardly therefrom in proximity to the terminus of the effluent pipe;
means to protect the effluent pipe from quench oil flowing over the ring;
a quench oil reservoir arranged concentrically around the upper portion of the quench chamber extending above the top of the ring; and

means to introduce quench oil into the quench oil reservoir and over the upper edge of the ring into the interior of the quench chamber to flow down the walls thereof;



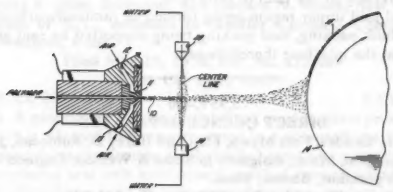
whereby when quench oil is made to flow down the walls of the quench chamber, the inside diameter of the quench oil film is the same as the inside diameter of the termination of the effluent pipe.

3,959,421

METHOD FOR RAPID QUENCHING OF MELT BLOWN FIBERS

Robert E. Weber, and Richard M. Peterson, both of Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 17, 1974, Ser. No. 461,740
Int. Cl.² B01J *2/06*
U.S. Cl. 264—6 **4 Claims**



1. In a method of producing a nonwoven fabric-like material without excessive formation of shot and fiber bonding, said method comprising the steps of

a. forming a gas stream containing melt blown microfibers in a molten condition, said microfibers comprising generally discontinuous synthetic, organic, thermoplastic polymeric microfibers having an average fiber diameter of up to about 10 microns, and

b. directing said gas stream onto a forming surface to form a nonwoven fabric-like material in which said microfibers are held together by gross mechanical entanglement with each other,

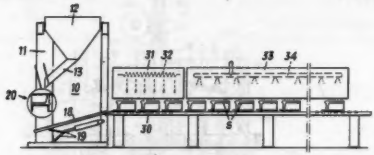
the improvement comprising the step of accelerating quenching of the melt blown microfibers before they reach the forming surface by spraying a liquid into said gas stream at a point where the melt blown microfibers are still at a temperature at which the microfibers would fuse together to form shot and fiber bonding and where the temperature of the gas stream is above the boiling point of said liquid so that said liquid is evaporated upon contact with the gas stream, said quenching by the liquid sparay avoiding the excessive formation of shot and fiber bonding.

3,959,422

PROCESS OF MANUFACTURING CONCRETE MOLDINGS

Denk Wilhelm, 30847 Mayflower, Roseville, Mich. 48066

Continuation of Ser. No. 247,973, April 27, 1973, abandoned. This application Sept. 3, 1974, Ser. No. 502,873
Int. Cl.² B06B *3/00*; B28B *1/08*
U.S. Cl. 264—23 **3 Claims**

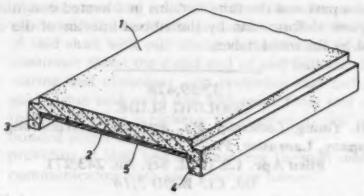


1. A process of manufacturing a concrete stair tread and riser comprising the steps of forming an homogeneous concrete mixture free of lumps and comprising 5–15 parts by weight of sand, 2–3 parts by weight of cement, and 1 part by weight of water; providing a two-part mold having a base plate, a fixed mold part secured to the base plate and a separable mold part removable from the base plate, the mold parts conjointly defining a mold cavity having the profile of a stair tread and riser, the mold having an initial position in which the stair tread profile is substantially horizontal and the riser profile extends upwardly from the tread profile; rotating the mold about its longitudinal axis to a charging position in which all surfaces of the mold cavity slope downwardly; charging said mixture without lumps into the mold while the latter is in its charging position, during a charging period having a duration of about 30–120 seconds; while the mold is in its charging position with said mixture therein, vibrating the mold from the beginning of the charging operation for a duration of 60–300 seconds until after the charging operation is completed to compact the mixture and avoid lumping, expel air from the mold and to form a molded concrete stair tread and riser in the mold; after the vibrating operation has been completed and before the molding has completely set, rotating the mold about its longitudinal axis to a stripping position in which the molded stair tread extends horizontally and the molded riser extends downwardly from the molded stair tread, with the molded stair tread and riser being supported entirely on the separable part of the mold; separating the separable part of the mold from the fixed part and base plate thereof along with the molded stair tread and riser; thereafter subjecting the molded stair tread and riser to a drying step to harden the surface thereof; and finally subjecting the molded stair tread and riser to a heat treatment with water vapor for a duration of 2–4 hours, said vibrating operation being carried out from the beginning of said charging operation at a frequency of about 150–200 cycles per second and with a thrust force of about 1500–3000 kilograms, and carrying out the drying by heat treatment for a period of substantially ten minutes.

3,959,423
MODULAR CONSTRUCTION SYSTEM

James Lee Boyd, Houston, Tex., assignor to Gerald D. Hines Interests, Houston, Tex.

Continuation-in-part of Ser. No. 395,189, Sept. 7, 1973, abandoned. This application Sept. 26, 1974, Ser. No. 509,709
Int. Cl.² E04B 1/16
U.S. Cl. 264—34 6 Claims



3. A method of constructing a structural slab of a building, comprising the steps of:

a. placing a forming module in juxtaposition to a plurality of vertically extending columns, said module containing at least a plurality of joist-forming members to be placed as a unit, at least some of said joist-forming members containing cut-away portions shaped to conform to ductwork members extending downwardly from the tops of said joist-forming members;

b. laying ductwork members in the cut-away portions of said joist-forming members, so as to seal said portions against subsequent leakage of concrete from said joist-forming members when step (d) is performed;

c. placing sheets of fire-resistant board between and upon adjacent pairs of joist-forming members; and

d. pouring concrete into said joist-forming members and over said sheets, to form a complete, monolithic structural slab section.

5. A method of making a section of a structural slab of a building floor, comprising the steps of:

a. implacing forming members for the casting of a pair of side sections of a slab soffit in spaced relationship to each other at a site removed from said building;

b. placing a sheet of fireproofing material between and upon said side-section forming members, said sheet extending partially over the top of each of said side-section forming members;

c. pouring concrete on said sheet and into said side-section forming members, to form a monolithic slab soffit having downwardly projecting side portions spaced apart a given distance;

d. removing said slab soffit from said side-section forming members;

e. placing a forming module in juxtaposition to a plurality of vertically extending columns of said building, said module containing at least a plurality of joist-forming members to be placed as a unit, the space between a pair of adjacent joist-forming members being substantially equal to said given distance;

f. placing at least one monolithic slab soffit made according to steps (a)-(d) between and upon an adjacent pair of said joist-forming members, the sides of said soffit extending downward partially into the respective joist-forming members; and

g. pouring concrete into said joist-forming members, up to the tops of said slab soffit, to form a complete, monolithic structural slab section.

3,959,424
METHOD FOR THE PREPARATION OF PLASTIC LINED PIPE

David H. Dawson, and Douglas S. Chisholm, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 7, 1973, Ser. No. 422,805
Int. Cl.² B29C 27/20
U.S. Cl. 264—88 1 Claim

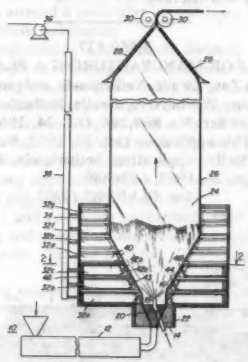
1. In a method for the lining of conduit or pipe, the method comprising providing a synthetic resinous thermoplastic liner and a rigid outer casing, the rigid outer casing defining a passageway extending therethrough, the liner having a diameter greater than the diameter of the passageway, compressing the liner in a generally radially inward direction to reduce the diameter thereof until the liner can be positioned within the outer casing, positioning the liner within the outer casing and subsequently permitting the diameter of the liner to increase to thereby tightly fit against the inner surface of the outer casing, the improvement which comprises

compressing the liner by applying thereto a hydrostatic force sufficient to cause the liner to flow through a liner diameter reducing swaging die, including the step of everting the liner as it is compressed radially inwardly.

3,959,425
METHOD FOR EXTRUDING TUBULAR THERMOPLASTIC FILM

F. John Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 366,388, June 4, 1973, Pat. No. 3,867,083. This application Aug. 14, 1974, Ser. No. 497,784
Int. Cl.² B29D 7/22
U.S. Cl. 264—89 4 Claims



1. In the process of producing thermoplastic film by melt extruding a seamless tube of thermoplastic material from an annular die orifice, increasing the pressure inside said tube upon extrusion; biaxially expanding said tubing as a result of increasing said pressure; cooling said extruded tubing to a solid state and flattening said expanded, cooled tube utilizing a pair of rotating draw rollers so as to entrap fluid between said flattening and said annular die orifice; the improvement of which comprises drawing said expanding extruded tubing outwardly to a greater extent utilizing a vacuum created by a plurality of pairs of superimposed diverging air streams surrounding said tubing, said air from said air streams being exhausted through annular openings located intermediate said divergent pairs of air streams, and conforming said expanding

tubing to a substantially diverging function having a maximum angle of divergence of less than 48°.

3,959,426

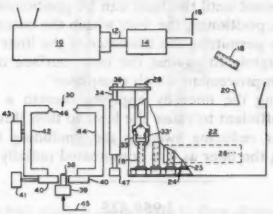
METHOD OF TRANSFERRING AND ALIGNING PARISONS USING CLAMPING JAWS WITH OFFSET TINES

Charles L. Seefluth, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 375,126, June 29, 1973, Pat. No. 3,870,446. This application Dec. 4, 1974, Ser. No. 529,552

Int. Cl.² B29C *17/07*

U.S. Cl. 264—94 **4 Claims**



1. A method of providing a thermoplastic parison at orientation temperature for blow molding comprising: heating said thermoplastic parison to orientation temperature; applying pressure inward to opposed sides of said parison from areas spaced apart axially a slight distance to thus close off said parison and extrude a plurality of flat flanges at right angles to a longitudinal axis of said parison; cooling said thus extruded flanges to a solid condition to provide a rigid support; and holding said parison by said flanges as said parison is transferred axially and laterally.

3,959,427

METHOD FOR MANUFACTURING A PLASTIC TUBE

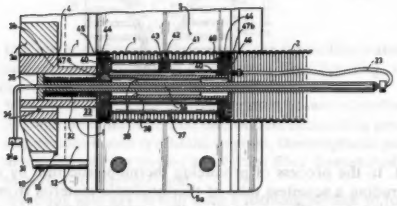
Cornelis Van Zon, Zwolle, Netherlands, assignor to Industriele Onderneming Wavin N.V., Zwolle, Netherlands

Division of Ser. No. 869,206, Oct. 24, 1969, Pat. No. 3,711,232. This application Oct. 20, 1972, Ser. No. 299,240

Claims priority, application Netherlands, Oct. 30, 1968, 6815449; Apr. 24, 1969, 6906380

Int. Cl.² B29C *17/07*

U.S. Cl. 264—99 **2 Claims**



1. A method of continuously manufacturing an open ended, externally deformed, thermoplastics tubular member by means of a tube extruder having an annular outlet and two die halves movable through an advance stroke along parallel paths whilst cooperating to form a hollow, internally transversely ribbed, die cavity, in which method the die halves are moved along such parallel paths with a portion of the tube extruded through said annular outlet extending within the die cavity, the interior of the tube being closed at two positions, by expandable discs and the pressure of a pressure medium of more than 1 atmosphere between said two positions within the tube being directly applied to the tube wall to press the tube wall against the interior of the die cavity until the outer side of the tube has been deformed during said advance stroke, after which said pressure is relieved and the die halves are moved apart from one another and returned to their starting position; and in which method the inner side of the tube portion extruded from said annular outlet during the advance movement of the die halves and situated between the annular outlet of the extruder and the first expansible disc as seen from the extruder in the conveying direction of the tube is connected with the exterior at least during the deformation of a tube part and the tube remains in a heated condition for subsequent deformation by the ribbed interior of die cavity formed by the mold halves.

3,959,428

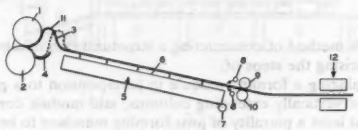
COOLING SLIDE

John H. Young, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Apr. 12, 1972, Ser. No. 243,271

Int. Cl.² B29D *7/14*

U.S. Cl. 264—145 **3 Claims**



1. A method of forming a product consisting the steps of consolidating thermoplastic material into a sheet form, feeding the thermoplastic material to an inclined fluid-covered slide to cool the material, at the point where the thermoplastic sheet leaves the water slide, retarding the movement of the sheet so that a free-standing hump is formed in the sheet in the region prior to the time the sheet enters the water slide whereby the sheet is being pushed down the water slide and subjected to compressive stresses.

3,959,429

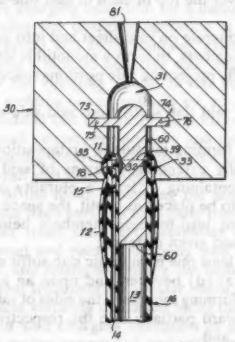
METHOD OF MAKING A RETENTION CATHETER AND MOLDING A TIP THEREON

Calvin J. Benning, Mahwah, N.J., assignor to International Paper Company, New York, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,297

Int. Cl.² B29C *5/00*; B29H *3/08*

U.S. Cl. 264—155 **11 Claims**



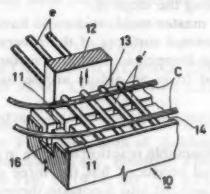
1. In a process for manufacturing a retention catheter having a distal end and a proximal end which comprises:

a. forming an elastomeric catheter shaft with a balloon sleeve surrounding said shaft and attached thereto and having a drainage lumen extending longitudinally thereof, and an inflation lumen extending longitudinally for at least a major portion thereof and communicating with the exterior of said shaft through an aperture adjacent the distal end of said shaft, said balloon being attached at its proximal end on the proximal side of said aperture;
b. inserting a guide in the drainage lumen of said shaft to support the distal end of said shaft;
c. inserting at least a portion of said shaft, including at least a portion of said guide and a distal portion of said balloon sleeve, in a mold;
d. injection molding a curable elastomer into a cavity between said mold and said guide so as to abut the distal end of said shaft with said elastomer and so as to mold said elastomer about the distal end of said balloon sleeve;
e. curing said elastomer, and removing said catheter and guide from said mold and said guide from said catheter, thereby forming a catheter tip bonded to said shaft and bonded about said balloon;
f. providing at least one drainage eye through said tip and communicating with said drainage lumen.

3,959,430
METHOD OF PRODUCING INTERLOCKING ELEMENTS FOR SLIDE FASTENERS

Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Nov. 7, 1974, Ser. No. 521,864
Claims priority, application Japan, Nov. 16, 1973, 48-129574
Int. Cl.² B29D *5/00*
U.S. Cl. 264—157 **3 Claims**

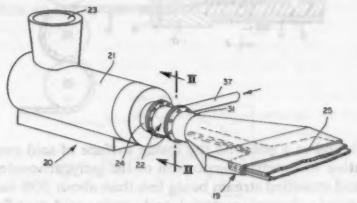


1. A method of manufacturing a series of discrete U-shaped fastener elements interconnected in a row, which method comprises intermittently advancing a plurality of elongated connecting members lengthwise and in mutually parallel relationship, holding a plurality of strip members spaced apart from one another by a distance corresponding to a selected pitch between adjacent fastener elements, feeding said strip members transversely across said connecting members for contact therewith at respective intersections, cutting said strip members to a given length, bonding said connecting members and strip members to each other at said intersections, and bending said strip members at portions thereof intermediate said connecting members to form each of said strip members into a U-shape to define a respective fastener element.

3,959,431
METHOD AND APPARATUS FOR MAKING MULTIPLE-LAYERED SHEETS

Frank R. Nissel, Ambler, Pa., assignor to Welex, Incorporated, Blue Bell, Pa.

Continuation of Ser. No. 287,509, Sept. 8, 1972, abandoned, and a continuation-in-part of Ser. No. 264,387, June 19, 1972, Pat. No. 3,833,704, which is a continuation-in-part of Ser. No. 118,410, Feb. 24, 1971, abandoned. This application Dec. 19, 1974, Ser. No. 534,428
Int. Cl.² B29D *7/04;* **B29F** *3/00*
U.S. Cl. 264—171 **8 Claims**



1. The method of making a multiple-layer sheet of thermoplastic material comprising:
a. forming a moving heat-plastified rod-shaped stream of a first thermoplastic substance in an adaptor upstream of a sheet-forming extruder die, said adaptor having a rod-shaped passageway for said stream;
b. dividing said stream into separate layers at a first location in said adaptor, introducing a second thermoplastic substance as a layer into and across said adaptor downstream of said first location to form a longitudinally disposed internal thermoplastic layer between said separate layers, said first thermoplastic substance being disposed less than half-way around a perimeter of said layer of said second thermoplastic substance;
c. while maintaining said stream divided, introducing a further layer of thermoplastic substance into the adaptor at a second location downstream from said first location between said layers previously introduced or formed and in such a manner as to provide with said second thermoplastic substance a plurality of different internal layers intermediate said separate layers, each of said separate layers being applied less than half-way around a perimeter of an adjacent said internal layer;
d. steps (b) and (c) being performed while maintaining a generally rod-shaped configuration for the substances in said adaptor, thereby forming a rod-shaped multilayer stream;
e. subjecting said rod-shaped multilayer stream to pressure within a transition portion of said die to spread said multilayer stream, and
f. extruding said multilayer stream as a multilayer sheet through said sheet-forming die.

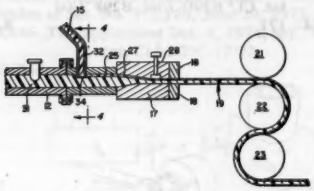
3,959,432
COEXTRUSION PROCESS

Donald F. Wiley, Big Spring, Tex., assignor to Cosden Oil & Chemical Company, Big Spring, Tex.

Filed Jan. 24, 1973, Ser. No. 326,241
Int. Cl.² B32B *27/28, 27/08*
U.S. Cl. 264—171 **6 Claims**

1. A process for the manufacture of composite sheeting having a major base layer of polystyrene and at least one relatively thin surface layer of polycarbonate polymer adhered thereto, comprising extruding a heat plastified stream of polystyrene at a temperature of from about 360°F. to about 450°F., extruding a heat plastified stream of polycarbonate polymer at a temperature of from about 550°F. to about

600°F., conveying said heat plastified stream of styrene polymer in a conduit having a generally circular cross-section, joining to the exterior surface of said styrene polymer stream within said conduit said heat plastified stream of polycarbonate polymer, thereby forming a single stratified stream of heat plastified materials conforming to the cross-section of said conduit and being characterized by distinct, contiguous layers of said two polymeric materials having a relatively sharply defined interface therebetween, said interface terminating at



each end at a point on the inside surface of said conduit, the relative volumetric proportion of the polycarbonate polymer in said stratified stream being less than about 20% based upon the total polymeric material, and passing said stratified stream of heat plastified material through a sheet-form extrusion die, said die having a die orifice width substantially greater than the diameter of said conduit and having its die lips generally transversely aligned with said interface between the two polymeric materials.

3,959,433

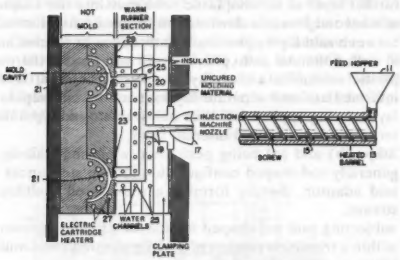
METHOD OF WARM RUNNER INJECTION MOLDING PHENOLIC RESINS WITH PARA-SUBSTITUTED PHENOL

Marvin Edward Sauers, Belle Mead, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 6, 1974, Ser. No. 503,688

Int. Cl.² B29G *3/00*

U.S. Cl. 264—328 **7 Claims**



1. In an injection molding process wherein a molding composition is fused and plasticized in injection means, wherein the fused and plasticized molding composition is injected through a runner system into a mold cavity, and wherein the runner system is maintained at a temperature at which the period of time within which said molding composition cures to a thermoset state is longer than the normal residence time of said molding composition in said runner system during said injection molding process, the improvement which comprises employing as said molding composition a composition suitable for use in injection molding, and which contains a phenolic resin composition comprising (a) a molding grade phenolic resin, and (b) an effective amount of a reactive phenolic compound that is capable of reducing the viscosity of molding compositions containing said molding grade phenolic resin to a processable viscosity at a temperature at which the period of time within which said molding composition cures to a thermoset state is longer than the period of time that said molding composition is in the runner during a normal injection molding operation, wherein said molding composition is adapted for use in an injection molding operation wherein the molding composition is fused and plasticized in injection means, and is injected by said injection means into a mold cavity through a runner which connects said injection means with said mold cavity, wherein said reactive phenolic compound is a compound having a melting point within the range of from about 35° to about 160°C., wherein said reactive phenolic compound is a parasubstituted phenol wherein the para substituent is alkyl, cycloalkyl, cycloalkenyl, phenyl, alkylphenyl, or hydroxyphenylalkyl, and wherein said reactive phenolic compound is employed in an amount within the range of from about 5 to about 35 parts by weight, per 100 parts of said molding grade phenolic resin.

3,959,434

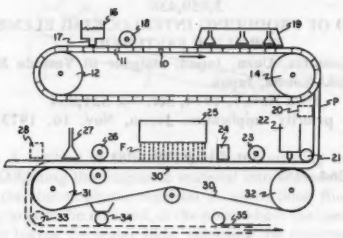
THREE DIMENSIONAL DECORATIVE MATERIAL AND PROCESS FOR PRODUCING SAME

William H. Squier, Taylors, S.C., assignor to M. Lowenstein & Sons, Inc., New York, N.Y.

Filed July 17, 1972, Ser. No. 272,340

Int. Cl.² B29C *25/00*; B29D *27/04*

U.S. Cl. 264—45.8 **25 Claims**



1. Process for producing a three dimensional decorative material comprising the steps of:

a. providing a master mold, said mold having cavities with three dimensional surfaces of the reverse of a predetermined design therein, said reverse surface design having been molded from an actual article having the design thereon;

b. casting a foamable polyurethane reaction mixture into said mold;

c. curing said foamable reaction mixture in situ whereby the foam material produced has the three dimensional surface design molded into a portion thereof;

d. stripping the foam material from the mold;

e. applying an adhesive onto said three dimensional, molded surface; and

f. applying flock textile fibers onto said adhesive.

3,959,435

PROCESSING OF IRRADIATED NUCLEAR REACTOR FUEL

Alfred Leonard Mills; Ernest Lillyman, and Peter Gordon Bell, all of Thurso, Scotland, assignors to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 160,119, July 6, 1971, abandoned. This application May 24, 1973, Ser. No. 363,551

Claims priority, application United Kingdom, July 7, 1970, 33028/76

Int. Cl.² B01D *11/04*

U.S. Cl. 423—10 **1 Claim**

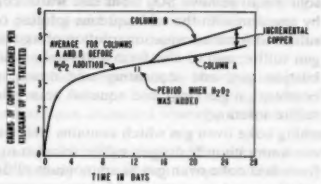
1. In the process for the treatment of irradiated nuclear fuel in which fissionable material in solution in nitric acid is contacted with tributyl phosphate diluted with an inert organic

diluent to transfer the fissionable material to the organic phase and the organic phase is separated from the aqueous phase and backwashed with an aqueous sulphuric acid solution the improvement wherein the concentration of the tributyl phosphate in the inert diluent is less than 7 volume percent and in subsequent steps the aqueous phase obtained after backwashing of the organic phase with sulphuric acid is conditioned with nutric acid, contacted with tributyl phosphate diluted with an inert organic diluent to a concentration not less than 20 volume percent and the resulting organic phase backwashed with dilute acid.

3,959,436
PROCESS FOR LEACHING SULFIDE MINERALS

John Conway Watts, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 26, 1974, Ser. No. 509,732
Int. Cl.² C01G 3/00, 9/00, 21/00, 53/00
U.S. Cl. 423—27 17 Claims


COLUMN B
AVERAGE FOR COLUMNS A AND B BEFORE H_2O_2 ADDITION
INCREMENTAL COPPER
COLUMN A
PERIOD WHEN H_2O_2 WAS ADDED
GRAMS OF COPPER LEACHED PER KILOGRAM OF ORE TREATED
TIME IN DAYS

1. In the process for leaching a metal sulfide mineral by contacting said mineral with an oxidative leaching solution to recover metal contained therein, the improvement comprising adding an aqueous solution of hydrogen peroxide to the oxidative leaching solution over a period of time of about 0.1 to about 50 percent of the total leaching time, said hydrogen peroxide being added in such an amount that on an absolute basis the quantity of hydrogen peroxide added varies from about 2 to about 25 percent by weight of the amount of hydrogen peroxide required to bring said metal into solution if hydrogen peroxide were the sole oxidizing agent.

3,959,437
HYDROMETALLURGICAL PROCESS FOR THE RECOVERY OF ZINC, COPPER AND CADMIUM FROM THEIR FERRITES

Jussi Kalevi Rastas, Pori; Tor-Leif Johannes Huggare, and Sigmund Peder Fugleberg, both of, Kokkola, all of Finland, assignors to Outokumpo Oy, Helsinki, Finland

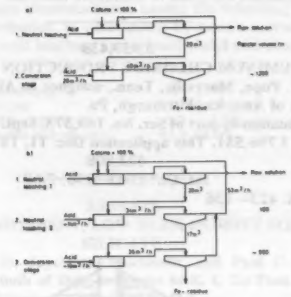
Filed Feb. 1, 1974, Ser. No. 438,653
Claims priority, application Finland, Feb. 12, 1973, 410/73
Int. Cl.² C01G 3/10, 9/00, 11/00, 49/14
U.S. Cl. 423—36 11 Claims

1. A hydrometallurgical process for the treatment of a raw material containing an oxide and a ferrite of at least one of the non-ferrous metals zinc, copper and cadmium, comprising neutral leaching said raw material with a sulfuric acid bearing solution to dissolve said oxide while leaving said ferrite substantially undissolved, separating a residue containing said ferrite, admixing additional sulfuric acid bearing solution and in the presence of ions selected from the group consisting of sodium potassium and ammonium ions with said residue at atmospheric pressure and at a temperature of from about 80° to 105°C, said additional sulfuric acid bearing solution containing sufficient sulfuric acid to satisfy the reaction:

$$3\,MeO.Fe_2O_3 + (7-x)H_2SO_4 + x\,A_2SO_4 + (2-2x)H_2O \rightarrow 2A_x(H_2O)_{1-x}[Fe_3(SO_4)_3(OH)_4] + 3\,MeSO_4$$

where Me is zinc, copper, or cadmium and A is sodium, potassium or ammonium, and x has a positive value not exceeding 1, and thereby causing said non-ferrous metals present to dissolve as sulfates while simultaneously precipitating iron as jarosite, and separating and recycling a solution containing said dissolved non-ferrous metals to said neutral leaching.

7. A hydrometallurgical process for the treatment of a raw material containing an oxide and a ferrite of at least one of the non-ferrous metals zinc, copper and cadmium, comprising neutral leaching said raw material with a sulfuric acid bearing solution to dissolve said oxide while leaving said ferrite substantially undissolved, separating a residue containing said ferrite, admixing ferric sulfate bearing solution and in the presence of ions selected from the group consisting of sodium potassium and ammonium ions with said residue at atmospheric pressure and at a temperature of from about 80° to 105°C, said ferric sulfate bearing solution containing sufficient ferric sulfate to satisfy the reaction:



$$\left(\frac{5+x}{4}\right)MeO.Fe_2O_3 + \left(\frac{7-x}{4}\right)Fe_2(SO_4)_3 + xA_2SO_4 + (9-3x)H_2O \rightarrow 2Ax(H_2O)_{1-x}[Fe_3(SO_4)_3(OH)_4] + \left(\frac{5+x}{4}\right)MeSO_4$$

where Me is zinc, copper or cadmium, and A is sodium, potassium or ammonium, and x has a positive value not exceeding 1, and thereby causing said non-ferrous metals present to dissolve as sulfates while simultaneously precipitating iron as jarosite, and separating and recycling a solution containing said dissolved non-ferrous metals to said neutral leaching.

3,959,438
METHOD FOR THE FABRICATION OF PURE ALUMINA FROM AL_2O_3 AND SILICA CONTAINING RAW MATERIALS BY LEACHING WITH HYDROCHLORIC ACID

Georg Messner, Latemar-Strasse 7, 8000 Munich 90, Germany

Filed Mar. 21, 1974, Ser. No. 453,265
Int. Cl.² C01F 7/02, 7/56
U.S. Cl. 423—126 19 Claims

1. Process for the recovery of alumina from Al_2O_3 and silicate containing raw materials which comprises continuously extracting said raw material by countercurrent leaching in an essentially vertical tower, with a solution containing essentially HCl and $FeCl_3$, to extract $AlCl_3$ from said raw material, crystallizing $AlCl_3 . 6H_2O$ from said leach solution by the substantially continuous washing with concentrated hydrochloric acid, moving said $AlCl_3 . 6H_2O$ crystals upwards through a closed essentially horizontal, slightly inclined crystallizer-washer thermal decomposer with conveyor means, washing said moving $AlCl_3 . 6H_2O$ crystals by a countercurrent flow of pure concentrated hydrochloric acid condensate in said crystallizer-washer thermal decomposer, heating said

moving $AlCl_3 \cdot 6H_2O$ crystals in said thermal decomposer to convert them into $Al(OH)_3$ and recovering the pure alumina.

3. A process for the production of pure alumina from alumina and silicate containing raw materials comprising feeding said raw material into an acid resistant leaching tower near the top thereof; continuously feeding a leaching liquor containing essentially hydrochloric acid and ferric chloride into the bottom of said leaching tower zone, so as to continuously flow upward countercurrently through said raw material to leach out the alumina as a solution enriched in aluminum chloride leaving a raw material solid residue; withdrawing said solution enriched in aluminum chloride from the top portion of said tower; withdrawing said raw material solid residue from the bottom portion of said tower zone providing a flowing carrier liquid containing hydrochloric acid conveying said solid residue away from said leaching tower separating said solid residue from said carrier liquid and recovering the carrier liquid, crystallizing and recovering aluminum hydroxide from the leach solution enriched in aluminum chloride.

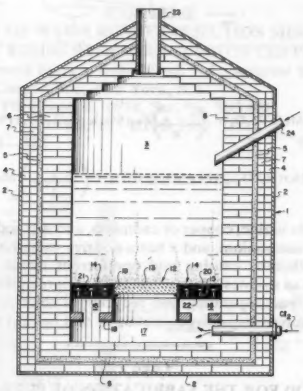
3,959,439
ALUMINUM CHLORIDE PRODUCTION PROCESS

Roy M. Pope, Maryville, Tenn., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 180,373, Sept. 14, 1971, Pat. No. 3,796,551. This application Dec. 11, 1973, Ser. No. 423,808

Int. Cl.² C01F 7/56, 7/60

U.S. Cl. 423—136 **8 Claims**



1. In the production of aluminum chloride by the chemical interaction of carbon and chlorine values with aluminous material

the improvement comprising

introducing said chlorine values in diffused gaseous form through a porous reagent inlet upwardly through a bed of particles of said aluminous material maintained in a fluidized condition thereby within a reaction zone of a reaction chamber having an outlet and including a multilayer lining that comprises

an inner and gas permeable lining wall of non-contaminating reaction-inert material,

an outer lining wall of heat insulating refractory material,

and an intermediate layer of reaction-inert, non-contaminating, highly compacted, high density particulate material disposed intermediate said inner and outer lining walls and of a bulk density of a magnitude that provides a resistance to gas flow there through that is greater than the resistance to gas flow extant in the reaction zone between the inlet and outlet of said reaction chamber and that effectively precludes displacement of said chlorine values through said intermediate layer.

3,959,440
METHOD FOR REMOVING SO_2 AND NO_x SIMULTANEOUSLY FROM THE EXHAUST OF A COMBUSTION FURNACE

Minoru Mizuno, Yokohama, and Tomoji Iwata, Kawasaki, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 30, 1975, Ser. No. 573,589

Claims priority, application Japan, May 8, 1974, 49-50896

Int. Cl.² B01D 53/34

U.S. Cl. 423—239 **5 Claims**

1. In combination with the method for removing SO_2 from waste combustion gas which contains SO_2 and NO_x comprising

washing said waste gas with an aqueous ammonium sulfite solution to remove SO_2 from said waste combustion gas by reaction with the said aqueous solution of ammonium sulfite to form an aqueous solution of ammonium hydrogen sulfite, and to also form a desulphurized waste combustion gas, and separating said desulphurized waste combustion gas from said aqueous ammonium hydrogen sulfite solution;

washing coke oven gas which contains NH_3 with said aqueous ammonium hydrogen sulfite solution to remove NH_3 from said coke oven gas as ammonium sulfite in aqueous solution, and separating said aqueous ammonium sulfite solution from said washed coke oven gas,

continuously circulating both said solutions betwee both washing systems;

the step subsequently of reducing the NO_x contained in said desulphurized waste combustion gas which has been separated from said aqueous ammonium hydrogen sulfite solution to N_2 comprising

controlling the pH value and temperature of said circulating aqueous solution of ammonium sulfite to a pH of between 6.1 and 6.5 and a temperature of between 50° and 55°C so that the NH_3 content in said desulphurized waste combustion gas derived from the circulating solution is in the amount of from 150 to 500 ppm;

heating said desulphurized waste combustion gas containing said 150 to 500 ppm of NH_3 to a temperature of between 200° and 450°C; and

contacting said heated desulphurized waste combustion gas with a reducing catalyst whereby said NO_x in said desulphurized waste combustion gas is reduced by said NH_3 in said waste gas to N_2.

3,959,441
DESULFURIZATION PROCESS

Isao Furuta, Mitaka; Kazuhito Yagaki, Kobe, and Toshihiko Masuda, both of Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Jan. 7, 1974, Ser. No. 431,158

Claims priority, application Japan, Aug. 3, 1973, 48-87813

Int. Cl.² C01B 17/00

U.S. Cl. 423—242 **9 Claims**

1. A process for the desulfurization of gases containing sulfur dioxide which comprises the steps of:

A. contacting said gases containing sulfur dioxide with an aqueous absorbing solution containing 25–33% by weight alkaline earth metal halide and 0.3 – 0.8% by weight hydroxide of said alkaline earth metal wherein the sulfur dioxide assumes the form of a solid alkaline earth metal sulfite; and

B. separating said solid alkaline earth metal sulfite from said aqueous absorbing solution.

3,959,442

PREPARING SINGLE CRYSTALS OF Li(Ho,Y,Er,Tm,Dy)F4 IN HF ATMOSPHERE

Ricardo C. Pastor, Manhattan Beach, and Morton Robinson, Malibu, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 7, 1974, Ser. No. 449,148
Int. Cl.² B01J *17/18*; C09K *1/04*; C01D *11/02*
U.S. Cl. 423—263 10 Claims

1. A method for preparing ultra pure single crystals of the formula ARF_4; wherein A is lithium and R is selected from the group consisting of holmium, yttrium, erbium, thulium and dysprosium; consisting of forming a congruent melting point ARF_4 compound by reacting molten AF and RF_3 in the presence of HF gas, allowing said compound to cool and pulling a single crystal from said congruent melt in the presence of HF wherein the forming a congruent melting point ARF_4 compound and crystal growth from the congruent melt consists of the steps of

a. placing said fluorides into a crucible within a high temperature furnace;
b. causing said furnace to be outgassed by applying a vacuum and purging said furnace with an inert gas;
c. introducing a reactive atmosphere into said furnace by causing HF gas to flow into said furnace;
d. causing said reactants to melt by slowly raising the temperature of said furnace until the melting point of said reactants has been exceeded whereby said reactants become molten;
e. allowing said molten reactants with said reactive atmosphere at a steady state molten temperature for approximately 6 hours;
f. reducing the temperature of said furnace to the proximity of the melting point of said reactants;
g. causing said molten reactants to nucleate by immersing a nucleation rod into said reactant melt;
h. pulling a single crystal on said nucleated rod by slowly withdrawing said rod from said melt while rotating said rod in said reactive atmosphere;
i. causing said crystal to separate from said melt by increasing the temperature of said furnace and the pull rate of said rod; and
j. allowing said crystal to cool to room temperature in the presence of said reactive atmosphere by decreasing the temperature of said furnace and purging said furnace with an inert gas.

3,959,443

METHOD OF SYNTHESIZING CUBIC CRYSTAL STRUCTURE BORON NITRIDE

Takahiko Kabayama, Hiratsuka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 26, 1974, Ser. No. 455,009
Claims priority, application Japan, Mar. 26, 1973, 48-33486; Aug. 22, 1973, 48-93291
Int. Cl.² C01B *35/08*
U.S. Cl. 423—290 11 Claims

1. A method of synthesizing cubic crystal structure boron nitride comprising subjecting a mixture of a hexagonal boron nitride or a boron compound and a catalyst to a pressure of at least 35,000 atmospheres and a temperature of at least about 1,000°C, wherein said catalyst is a silicon and aluminum-containing material selected from the group consisting of a silicon-aluminum alloy, a mixture of silicon and aluminum alloy, a mixture of silicon and aluminum, a mixture of silicon and aluminum nitride and a mixture of silicon and aluminum boride.

3,959,444

MAGNESIUM ALUMINOSILICATE AND PROCESS FOR THE MANUFACTURE THEREOF

Hideharu Yokoi; Tetuo Haginaka, both of Toyama; Mitiji Inagaki, Namerikawa, all of Japan, assignors to Fuji Chemical Industry Co., Ltd., Japan

Filed Feb. 27, 1973, Ser. No. 336,207
Claims priority, application Japan, May 22, 1972, 47-50506
Int. Cl.² C01B *33/22*, *33/26*
U.S. Cl. 423—328 7 Claims

1. A process for the manufacture of magnesium aluminosilicate which comprises reacting polymeric sodium silicate, partially neutralized to the extent that the molar ratio of SiO_2:-Na_2O is 8–20:1 and having a siloxane structure of a silicic acid with a polymerization degree of 10^2 to 10^4, in an aqueous medium with sodium aluminate in an atomic ratio of Al to Si of 1 – 2: 1 and then reacting the reaction product in an aqueous medium with a water soluble magnesium salt in an atomic ratio of Mg to Al of 0.5– 1:1.

5. Magnesium aluminosilicate having the following silicate structure distribution as determined by Lenz's technique of simultaneous acid leaching and trimethylsilyl end-blocking:

Orrhosilicate	0 – 0.9%
Disilicate	0 – 0.1%
Soluble polysilicate	2.0 – 3.5%
Insoluble polysilicate	95.5–98.0%.

3,959,445

HIGHLY ABSORBENT, LOW BULK DENSITY SODIUM SILICATE

Madhusudan D. Jayawant, Hockessin, and Paul C. Yates, Talleyville, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 355,498, April 30, 1973, abandoned. This application Dec. 19, 1973, Ser. No. 425,970
Int. Cl.² C01B *33/32*
U.S. Cl. 423—332 7 Claims

1. Amorphous, water-soluble agglomerates of spheroidal alkali metal silicates having a mol ratio of SiO_2 to alkali metal oxide of 1 to 3.75, a specific nitrogen surface area between 2.5 and 7 $m.^2/g.$, a bulk density of less than 0.5 g./cc., an absorbency for nonionic surfactants of from 70% to 400% by weight of silicate, as measured by the weight percent of a linear alcohol ethoxylate nonionic surfactant comprising a mixture of alcohols having 12 to 15 carbon atoms condensed with twelve mols of ethylene oxide to an average molecular weight of 745, a density of 1.003 and a melting point of 30° to 33°C. that can be added to a given weight of alkali metal silicate beofre there is a sign of unabsorbed surfactant relative to the weight of silicate; a maximum water content of 25% by weight and a maximum active oxygen content of 1.33% by weight.

3,959,446

SYNTHESIS OF HIGH PURITY, ALPHA PHASE SILICON NITRIDE POWDER

Khodabakhsh S. Mazdiyasni, Xenia, and Charles M. Cooke, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 1, 1974, Ser. No. 447,424
Int. Cl.² C01B *33/06*
U.S. Cl. 423—344 8 Claims

1. A method for preparing high purity, alpha silicon nitride powder which comprises the steps of:

a. reacting high purity, liquid silicon tetrachloride with anhydrous ammonia gas in dry deoxygenated benzene or dry normal hexane at a temperature in the range of about −10°C to 5°C, the mole ratio of silicon tetrachloride to ammonia gas being about 1 to 6, thereby forming a precipitate of a mixture of silicon diimide and ammonium chloride;

b. removing deoxygenated benzene or normal hexane from the mixture;

c. recovering the resulting dried mixture of silicon diimide and ammonium chloride, the mixture being in finely divided form;

d. heating the mixture of silicon diimide and ammonium chloride under a vacuum or in an inert atmosphere to a temperature in the range of about 1200° to 1350°C; and

e. maintaining the mixture at a temperature in said range for a period of about 2 to 8 hours, thereby converting the mixture to a product consisting of alpha silicon nitride.

3,959,447
PROCESS FOR THE PREPARATION OF CARBONATED HYDRATED ZIRCONIUM OXIDE

Wilhelm Brugger, Hosel, Germany, assignor to Th. Goldschmidt AG, Germany

Filed Oct. 30, 1974, Ser. No. 519,242

Claims priority, application Germany, Nov. 28, 1973, 2359173

Int. Cl.² C01G *25/00*

U.S. Cl. 423—419 **3 Claims**

1. A process for preparing carbonated hydrated zirconium oxide which comprises dispersing zirconium oxychloride in an inert, non-polar solvent and reacting it, without the addition of water, with an at least equimolar quantity of ammonium carbonate or potassium carbonate, and separating the reaction product.

3,959,448
PROCESS FOR THE MANUFACTURE OF CARBON FIBERS

Robert John Fuller, Great Bookham; William Redvers Ladner, Leatherhead, and Ernest Pritchard, Woking, all of England, assignors to Coal Industry (Patents) Limited, London, England

Continuation of Ser. No. 347,633, April 4, 1973, abandoned, which is a continuation of Ser. No. 67,600, Aug. 27, 1970, abandoned. This application Feb. 4, 1975, Ser. No. 546,918

Claims priority, application United Kingdom, Aug. 27, 1969, 42675/69

Int. Cl.² C01B *31/07*

U.S. Cl. 423—447 **6 Claims**

1. In a process for producing fibers or filaments of carbon comprising

melt spinning a carbonaceous material to form a spun fiber or filament,

oxidizing the spun fiber or filament of said carbonaceous material at a temperature below that at which is softens and for a length of time necessary to render it infusible thereby stabilizing said fiber or filament and

carbonizing the stabilized fiber or filament, the improvements comprising (a) employing as the carbonaceous material a filtered solution or extract of coal, said solution or extract of coal being formed by contacting and dissolving or extracting coal with a solvent boiling at above 200°C. which dissolves or extracts soluble or solubilizable aromatic constituents of coal to form a solution or extract of coal, filtering the solution or extract of coal and concentrating said solution or extract of coal to produce a filtrate containing 40–60% solvent and (b) as the step of oxidizing the spun fiber or filament, oxidizing the spun fiber or filament with air or oxygen at a heating rate of at least about 1°C/min., whereby said fiber or filament is stabilized to further heat treatment, said heat treatment including said step of carbonizing said stabilized fiber or filament.

3,959,449
METHOD OF RECOVERING HEAVY METAL [-BROMINE] BROMIDES AND HYDROBROMIC ACID CATALYSTS FOR LIQUID-PHASE OXIDATION [CATALYST]

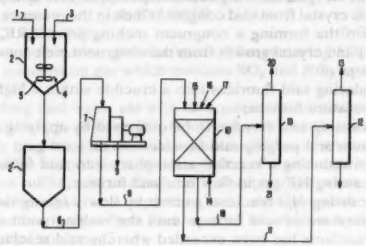
Motoo Shigeyasu; Takeo Ozaki, and Nobuo Kusano, all of Matsuyama, Japan, assignors to Matsuyama Petrochemicals Inc., Osaka, Japan

Filed Apr. 1, 1974, Ser. No. 456,717

Claims priority, application Japan, Mar. 30, 1973, 48-36351; Apr. 26, 1973, 48-47826

Int. Cl.² C01B *7/12*; C01G *51/08, 45/06*; B01D *11/02*

U.S. Cl. 423—488 **20 Claims**



1. A method of recovering one or more heavy metal bromides and hydrobromic acid which are the components of an oxidation catalyst in highly-pure states without being contaminated with organic impurities and heavy metal impurities harmful to the oxidation reaction from the reaction mother liquor residue containing the oxidation catalyst, the organic impurities comprising by-products and intermediates of the oxidation reaction, and a small amount of heavy metal impurities, said reaction mother liquor residue having been obtained by separating terephthalic acid from the oxidation reaction product prepared by the liquid-phase oxidation of an alkylbenzene in the presence of heavy metal bromine oxidation catalyst using a lower aliphatic monocarboxylic acid as the solvent and then recovering the solvent from the reaction mother liquid, which method comprises

A. stirring said reaction mother liquor residue together with water as solvent in the presence of a sulfur compound selected from the group consisting of hydrogen sulfide, sodium sulfide, sodium hydrosulfide, potassium hydrosulfide, and ammonium hydrosulfide which converts heavy metal impurities such as lead, molybdenum, copper and nickel to their respective sulfides while blowing a molecular oxygen-containing gas into said residue water mixture or dissolving a molecular oxygen-containing gas into the residue under pressure, whereby the oxidation catalyst is extracted with water,

B. subjecting the extracted mixtures thus obtained to a solid-liquid separation to separate impurities as solid materials,

C. passing the catalyst-containing extract through a column packed with a strongly-acidic cation-exchange resin to absorb thereon the catalyst heavy metal or metals,

D. distilling the ion-exchanged solution passed through the cation-exchange resin-packed column, said solution being the fractions having discharged from the bottom of the column by the time when said heavy metal catalyst just begins to leak in the ion-exchanged solution, whereby bromine contained in the solution is recovered as hydrobromic acid,

E. passing hydrobromic acid through the column packed with the cation-exchange resin having absorbed thereon the catalyst heavy metal or metals to desorb the heavy metal or metals therefrom, and

F. distilling the eluate thus recovered to recover excessive hydrobromic acid and then the bromide or bromides of the catalyst heavy metal or metals.

3,959,450

PREPARATION OF PURE BROMINE FROM AQUEOUS HYDROBROMIC ACID SOLUTIONS

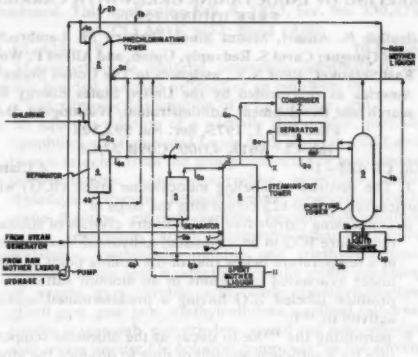
Georges Calloue, and Jean Hughes, both of Port-de-Bouc, France, assignors to Octel-Kuhlmann, Paris, France

Filed Sept. 16, 1974, Ser. No. 506,596

Claims priority, application France, Sept. 25, 1973, 73.34250

Int. Cl.² C01B 7/00

U.S. Cl. 423—507 2 Claims



1. A method for producing substantially pure liquid bromine from an aqueous mother liquor or sea-water concentrate containing per liter about 0.12 to 0.15 kilograms hydrogen bromide, about 5 to 10 grams hydrochloric acid and about 0.09 to 0.11 kilograms sulfuric acid, which method comprises

a. supplying a fraction I comprising about **90-95%** by weight of said liquor to a prechlorinating stage in step (b) and supplying a fraction II comprising the remaining about **10-5%** of the liquor to a washing or purifying stage in step (e);

b. prechlorinating liquor fraction I by reacting it with about 80–90% of the weight of chlorine stoichiometrically equivalent to the total weight of bromide supplied in both fractions I and II, to produce a substantial first yield of substantially pure liquid bromine and also elementary bromine dissolved in liquor fraction I;

c. separating liquor fraction I containing dissolved bromine from the first pure liquid bromine and collecting said first substantially pure liquid bromine directly without distillation;

d. steam-distilling the separated liquor fraction I containing dissolved elementary bromine, in the presence of sufficient chlorine to bring the total amount of chlorine used in steps (b) and (d) to about **101%** of the weight of chlorine stoichiometrically equivalent to the total weight of bromide originally in fractions I and II, and condensing crude liquid bromine containing chlorine as an impurity;

e. washing said crude liquid bromine substantially free of chlorine by contacting it with liquor fraction II defined in step (a), to produce a second yield of substantially pure liquid bromine and to convert the chlorine impurity to chloride dissolved in fraction II; and

f. separating said fraction II from the second substantially pure liquid bromine and collecting the second pure liquid bromine.

3,959,451

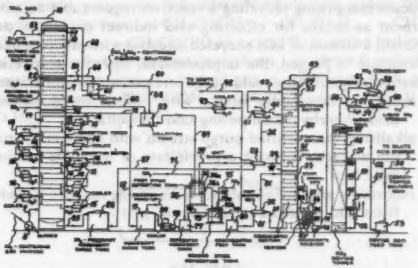
RECOVERY OF SULFUR DIOXIDE FROM GAS MIXTURES

James M. Henderson, New Brunswick, N.J., and William H. Wetherill, Staten Island, N.Y., assignors to Asarco Incorporated, New York, N.Y.

Filed Feb. 26, 1974, Ser. No. 446,081

Int. Cl.² C01B 17/48

U.S. Cl. 423—539 26 Claims



25. In a process for recovering sulfur dioxide from a gas mixture containing the same comprising absorbing sulfur dioxide from the gas mixture by contacting the gas mixture in an absorption zone with a liquid water-insoluble aromatic amine absorbent capable of releasing the sulfur dioxide upon subsequent treatment, treating sulfur dioxide-pregnant aromatic amine absorbent withdrawn from the absorption zone to cause the sulfur dioxide to be released from the liquid absorbent, recovering the thus-released sulfur dioxide, and scrubbing sulfur dioxide-impoverished effluent gas containing gaseous aromatic amine absorbent from the absorbing zone in a sulfuric acid scrubbing zone with dilute sulfuric acid solution to remove the aromatic amine absorbent from the gas, the improvement which comprises subsequent to the sulfur dioxide-absorbing and prior to the sulfuric acid solution scrubbing, scrubbing the sulfur dioxide-impoverished effluent gas containing gaseous aromatic amine absorbent from the absorption zone in a sulfurous acid scrubbing zone with sulfurous acid solution also containing ammonium sulfate to remove a major portion of the organic base absorbent from the gas, the presence of the ammonium sulfate in the aqueous solution in the sulfurous acid scrubbing zone resulting in an appreciably greater recovery of the aromatic amine in said sulfurous acid scrubbing zone than in the absence of ammonium sulfate, the sulfurous acid-and ammonium sulfate-containing aqueous solution being formed in the sulfurous acid scrubbing zone by supplying sulfur dioxide-containing gas into the scrubbing zone which is in addition to sulfur dioxide contained in the sulfur dioxide-impoverished effluent gas passing into the sulfurous acid scrubbing zone from the absorption zone, and supplying at least 50 percent by volume of a liquid aqueous solution consisting essentially of dissolved ammonium sulfate withdrawn from an absorbent regenerating zone into said sulfurous acid scrubbing zone than in the absence of ammonium sulfate, the sulfur dioxide being dissolved in the water of the liquid aqueous solution consisting essentially of dissolved ammonium sulfate in the last-mentioned scrubbing zone to form the sulfurous acid-and ammonium sulfate-containing aqueous solution, a reduced amount of sulfuric acid solution being required for removal of the residual aromatic amine absorbent from the gas in the sulfuric acid scrubbing zone due to the scrubbing removal of the aromatic amine from the gas with the sulfurous acid-and ammonium sulfate-containing aqueous solution in the sulfurous acid scrubbing zone.

3,959,452

PROCESS FOR REMOVING HYDROGEN SULFIDE FROM CONTAMINATED GAS

Wilton F. Espenscheid, Princeton, and Tsoung-Yuan Yan, Trenton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 15, 1975, Ser. No. 577,572
Int. Cl.² C01B 17/04
U.S. Cl. 423—573 G 10 Claims

1. In the process of purifying a hydrogen sulfide contaminated gas by indirectly oxidizing the hydrogen sulfide with oxygen gas to form elemental sulfur and purified gas, said process comprising recycling a reactive, regenerable aqueous sorbent as means for effecting said indirect oxidation, and wherein a stream of said recycled aqueous sorbent containing thiosulfate is purged, the improvement, whereby recovering reactive reagents from said purge stream, which comprises:

acidifying said purge stream with sulfuric or phosphoric acid whereby decomposing said thiosulfate;

alkalizing the acidified purge stream with calcium hydroxide whereby forming a precipitate of insoluble calcium salts; and

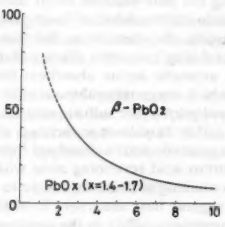
recovering an alkaline solution comprising reactive reagents from said alkalized purge stream.

3,959,453

METHOD FOR MANUFACTURE OF SINGLE CRYSTALS β-PbO_2 AND SLENDER SINGLE CRYSTALS OF β-PbO_2 PRODUCED THEREBY

Eiichi Torikai, Yazo, and Yoji Kawami, Kawachi-Nagano, both of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Nov. 26, 1974, Ser. No. 527,434
Claims priority, application Japan, Dec. 4, 1973, 48-136363
Int. Cl.² C01G 21/02
U.S. Cl. 423—619 6 Claims



1. A method for the manufacture of single crystals of β-PbO_2 which comprises:

immersing a non-stoichiometric oxide represented by the formula PbO_x, wherein x denotes a value falling within the range of 1.4 – 1.7, but excluding Pb_2O_3 and having the specific structural formula of $Pb_{12}O_{17}$ or $Pb_{12}O_{19}$ in an aqueous solution of an alkali metal hydroxide selected from the group consisting of sodium hydroxide, potassium hydroxide and lithium hydroxide;

heating said aqueous solution in which said lead oxide has been immersed to a temperature in the range of 230° – 280°C and at the same time exerting pressure thereon with a gas containing at least 20% by volume oxygen, thereby producing single crystals of β-PbO_2 in said aqueous solution; and

thereafter separating said β-PbO_2 crystals from said aqueous solution.

6. Black column-shaped β-PbO_2 single crystals measuring 0.2 to 1.0 in diameter and 5 to 15mm in length and having a metallic gloss.

3,959,454

PRODUCTION OF SODIUM ALUMINUM HYDRIDE

Walter Rogler, Bonn; Otto Bleh, Bergheim, Sieg, and Wilhelm Joch, Niederkassel, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Mar. 18, 1971, Ser. No. 125,819
Claims priority, application Germany, Apr. 18, 1970, 2018765
Int. Cl.² C01B 1/00
U.S. Cl. 423—644 5 Claims

1. In th production of sodium aluminum hydride by reaction of an aluminum chloride etherate with sodium hydride in an inert liquid dispersing agent, the improvement which comprises using as said sodium hydride reagent coarse-crystalline free flowing non-self-igniting sodium hydride which is first ground in said dispersing agent to a particle size less than about 12 microns.

3,959,455

LABELING OF INDOCYANINE GREEN WITH CARRIER-FREE IODINE-123

Azizullah N. Ansari, Mount Sinai; Richard M. Lambrecht, East Quogue; Carol S. Redvanly, Upton, and Alfred P. Wolf, East Setauket, all of N.Y., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 1, 1975, Ser. No. 592,305
Int. Cl.² A61K 43/00; C09B 23/08
U.S. Cl. 424—1 4 Claims

1. The method of labeling indocyanine green (ICG) with carrier-free iodine-123 comprising the steps of:

a. condensing carrier-free ^{123}Xe on dry crystals of substantially pure ICG in an evacuated anhydrous environment at a temperature below that of the boiling point of ^{133}Xe under evacuated conditions in an amount sufficient to produce labeled ICG having a predetermined specific activity of ^{123}I;

b. permitting the ^{123}Xe to decay at the aforesaid temperature for a sufficient amount of time to produce the aforesaid specific activity;

c. removing any remaining ^{123}Xe by warming the ICG to a temperature above that of the boiling temperature of said ^{123}Xe;

d. dissolving the remaining product;

e. removing the remaining ^{123}I from the dissolved product; and

f. evaporating the dissolved product to dryness.

3,959,456

DIAGNOSTIC SLIDE TEST FOR INFECTIOUS MONONUCLEOSIS

Joseph Zichis, Chicago, Ill., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Division of Ser. No. 112,062, Feb. 2, 1971, Pat. No. 3,826,821, which is a continuation-in-part of Ser. No. 583,433, Sept. 30, 1966, abandoned. This application June 20, 1974, Ser. No. 481,146
Int. Cl.² G01N 31/00, 31/06, 33/16
U.S. Cl. 424—12 10 Claims

1. A serological diagnostic test in which the reactions are carried out on a slide, comprising the steps of:

a. obtaining human blood serum suspected to contain the heterophil antibody characteristic of infectious mononucleosis;

b. mixing on a slide an aliquot of said serum with a first antigen which neutralizes without agglutination the Forssman type heterophil antibodies, but not the infectious mononucleosis antibody;

c. mixing on a slide an aliquot of said serum with a second antigen which neutralizes without agglutination the infectious mononucleosis antibody, but not the Forssman type antibodies;

d. adding to each of the mixtures resulting from the preceding steps a third antigen prepared from erythrocytes which is free of hemoglobin and which is agglutinative with the unneutralized heterophil type antibodies; and

e. observing, in the case of a positive test for infectious mononucleosis, occurrence of agglutination on the slide having thereon the serum-antigen mixture containing said first antigen and no agglutination on the slide having thereon the mixture containing said second antigen.

3,959,457
MICROPARTICULATE MATERIAL AND METHOD OF MAKING SUCH MATERIAL

Tully J. Speaker, Philadelphia, Pa., and Lawrence J. Lesko, Houston, Tex., assignors to Temple University, Philadelphia, Pa.

Continuation-in-part of Ser. No. 43,925, June 5, 1970, abandoned. This application Feb. 8, 1973, Ser. No. 330,476

Int. Cl.² A61K *9/52;* **B01J** *13/02*

U.S. Cl. 424—19 **10 Claims**

4. Microparticulate material, consisting essentially of the ionically bonded reaction product of an emulsion of

a. a water immiscible solution of a Lewis base, and

b. an aqueous solution of a partially hydrophilic, partially lipophilic, polyfunctional Lewis acid, wherein said Lewis base is selected from the group consisting of hexylamine, isopentylamine, n-methylpiperidine, piperidine, dimethylethylenediamine, hexanediamine, piperazine, triethylene diamine, ethylenediamine, hexamethylrosanilium cation, rosanilium cation, tetramethylrosanilium cation, melamine, tetraethylpentamine and triethyltetramine, and said Lewis acid is selected from the group consisting of acacia gum, arabic acid, carboxymethylcellulose, ghatti gum, guar gum, methylcellulose, oxidized cellulose, pectin, tragacanth, polyethylene glycol and agar, wherein said water immiscible solution comprises, as the solvent thereof, a polar solvent having a dielectric constant of no less than 4 Debye units, and wherein said microparticulate material further includes, entrapped in said reaction product, a material essentially non-reactive with the reactants and reaction product therein and which is diffusible through said reaction product.

5. Microparticulate material, as recited in claim 4, wherein said entrapped material has pharmaceutical activity.

3,959,458
ORAL COMPOSITIONS FOR CALCULUS RETARDATION

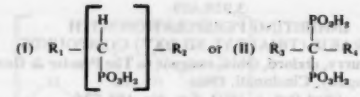
Francis Oswald Agricola; William Watson Briner; Robert James Granger, and James Stone Widder, all of Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 329,783, Feb. 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 223,353, Feb. 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 106,921, Jan. 20, 1971, abandoned. This application Aug. 30, 1974, Ser. No. 501,909

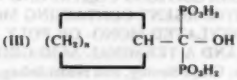
Int. Cl.² A61K *7/18*

U.S. Cl. 424—52 **17 Claims**

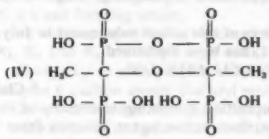
1. An oral composition effective in inhibiting the formation of dental calculus without adversely affecting the tooth structure, dental enamel and silicate filling structure, comprising (1) from about 0.01% to about 10% by weight of an anticalculus agent which would otherwise severely attack the silicate filling structure when used in combination with non-monofluorophosphate water-soluble fluorine sources, said agent being selected from the group consisting of those of the formulae:

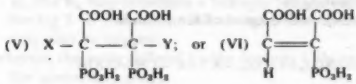


wherein R_1 and R_2 are either hydrogen or CH_2OH; n is an integer of from 3 to 10; R_3 is either hydrogen, an alkyl group containing from 1 to about 20 carbon atoms, an alkenyl group containing from 2 to about 20 carbon atoms, a phenyl group, a naphthyl group, a phenylethenyl group, a benzyl group, a halogen atom, an amino group, a dimethylamino group, a diethylamino group, an N-hydroxy-N-ethylamino group, an acetylamino group, $-CH_2COOH$, $-CH_2PO_3H_2$, $-CH(PO_3H_2)(OH)$ or $-CH_2CH(PO_3H_2)_2$; and R_4 is either hydrogen, a lower alkyl group containing from 1 to about 6 carbon atoms, an amino group, a benzyl group, a halogen atom, a hydroxyl group, $-CH_2COOH$, $-CH_2PO_3H_2$, or $-CH_2CH_2PO_3H_2$;

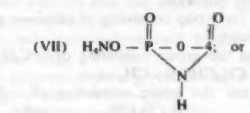


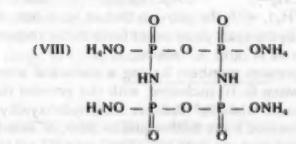
wherein n is an integer from 3 to 9;





wheren X and Y are each hydrogen or hydroxy; or an orally acceptable salt thereof selected from the group consisting of the alkali metal, ammonium and low molecular weight substituted ammonium salts; or the condensation products of ammonia and phosphorus pentoxide, having the formulae:





and mixtures thereof; and (2) as the essential fluorine source from about 0.2% to about 8% by weight of an orally acceptable monofluorophosphate, said composition containing no more than 300 ppm of any other water-soluble fluorine source, the pH of the composition being within the range of from about 6.0 to about 7.5.

3,959,459
INHIBITING PERSPIRATION WITH TETRAKIS-(TRIALKYL SILOXY) COMPOUNDS

John D. Curry, Oxford, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 4, 1971, Ser. No. 186,534
Int. Cl.[2] A61K 7/32, 7/34
U.S. Cl. 424—66 3 Claims

1. A method for inhibiting perspiration comprising applying to human skin an effective amount of a tetrakis(trialkylsiloxy) compound of the formula

$$M(OSiR_3)_4$$

wherein M is selected from the group consisting of titanium and zirconium and wherein each substituent R is alkyl, cycloalkyl or branched chain alkyl of from about C_1 to C_{14}.

3,959,460
COSMETIC COMPOSITIONS CONTAINING ANIONIC SURFACE ACTIVE AGENT CONTAINING MONO- OR POLYHYDROXYLATED MONO- OR POLY ETHER CHAINS AND A TERMINAL ACID GROUP

Guy Vanlergerghe, Claye-Souilly, and Henri Sebag, Paris, both of France, assignors to L'Oreal, Paris, France

Continuation-in-part of Ser. No. 264,864, April 21, 1972, Pat. No. 3,822,346, which is a continuation of Ser. No. 749,580, Aug. 2, 1968, abandoned. This application May 1, 1974, Ser. No. 466,060
Claims priority, application Luxemburg, Aug. 7, 1967, 54263
The portion of the term of this patent subsequent to July 2, 1991, has been disclaimed.
Int. Cl.[2] A61K 7/00
U.S. Cl. 424—70 5 Claims

1. A cosmetic composition consisting essentially of in an aqueous solution a surface active agent selected from the group consisting of

a. a surface active agent of the formula

$$RX-(AO)_m-(A'O)_n-A''-X'-\underset{\displaystyle R'}{\underset{|}{CH}}-COOH$$

wherein

R is selected from the group consisting of alkyl and alkenyl, each having 8–22 carbon atoms and alkyl phenyl selected from the group consisting of p-octyl phenyl, p-nonyl phenyl, p-dodecyl phenyl and p-hexadecyl phenyl;

X and X′ are each selected from the group consisting of oxygen, sulfur and sulfoxide;

A is selected from the group consisting of ethylene, propylene and butylene;

A′ is selected from the group consisting of $-C_3H_3(CH_2OH)-$ and $-CH_2CHOH-CH_2-$;

A″ is selected from the group consisting of $-CH_2-CHOH-CH_2-$, $-CH_2CH_2CH_2-$ and $-CH_2CH(CH_3)$, with the proviso that at least one of A′ and A″ is hydroxyalkylene as set forth in the respective definitions of A′ and A″ above;

m and *n* represent numbers having a statistical average value between 0–10 inclusive, with the proviso that *n* is other than 0 when A″ is other than hydroxyalkylene and when *m* and *n* are both equal to zero, X′ is sulfoxide; and

R′ is selected from the group consisting of hydrogen and alkyl having from 1–12 carbon atoms,

b. the magnesium salt of (a); and

c. the alkanolamine salt of (a), said alkanolamine being selected from the group consisting of 2-amino-2-methyl propanol, triethanolamine and 2-amino-2-methyl-1,3-propanediol, said surface active agent being present in amounts ranging from 0.1 – 20% by weight of said composition.

3,959,461
HAIR CREAM RINSE FORMULATIONS CONTAINING QUATERNARY AMMONIUM SALTS

August V. Bailey, and Gene Sumrell, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 28, 1974, Ser. No. 473,477
Int. Cl.[2] A61K 7/08
U.S. Cl. 424—70 3 Claims

1. A hair cream rinse formulation comprising two parts of lanolin, three parts of cetyl alcohol, 85 parts of water, and 10 parts of a quaternary ammonium salt selected from the group consisting of

$$[RCONHCH_2CH_2N(CH_3)CH_2C_6H_5]^+ Cl^-$$

and

$$\left[\begin{array}{l} \diagup\ CH_2N(CH_3)_2CH_2C_6H_5 \\ RCOOCH \\ \diagdown\ CH_2N(CH_3)_2CH_2C_6H_5 \end{array}\right]^{++} 2\,Cl^-$$

wherein R is a saturated normal alkyl group of about 11 to 21 carbon atoms.

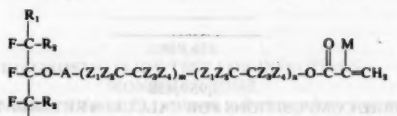
3,959,462
HAIR CARE PRODUCTS CONTAINING FLOUROCARBON POLYMERS FOR KEEPING HAIR CLEANER LONGER

Lawrence Roy Parks, Springfield Township, Hamilton County, and Stuart Elliot Builder, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 26, 1974, Ser. No. 500,431
Int. Cl.[2] A61K 7/06
U.S. Cl. 424—70 16 Claims

8. A hair care composition for use in retarding the rate of sebum flow on hair containing a liquid carrier and from 0.01% to 7% of a polymerization product of:

A. 50% to 95% by weight of a monomer having the following structure:



wherein

1. R_1 and R_2 are each F, Cl, alkyl or haloalkyl groups, or when taken together, are alkylene or haloalkylene groups forming a cycloaliphatic structure, which R_1 and R_2 groups may each have from 1 to 9 carbon atoms and which halogen atoms, if any, have an atomic weight not exceeding about 79.92, with the proviso that no more than two of the R_1 and R_2 groups are alkyl groups and no more than three of the R_1 and R_2 groups are haloalkyl groups;
2. A is a radical of the formula $-CFR_3-CR_4R_5-$ in which R_3 and R_4 are independently selected from the group consisting of F and H, and R_5 is selected from the group consisting of H, F, Cl, Br and perfluoroalkyl;
3. Z_1, Z_2, Z_3 and Z_4 may each be selected from the group consisting of H, F, Cl and Br provided that $Z_1 - Z_4$ do not include more than two chlorine atoms or one bromine atom,

a. when at least two members of the group Z_1, Z_2, Z_3 and Z_4 are H or F, the remaining two members may each be a perhalomethyl group having the formula $—C(X_a)_3$, wherein X_a is a halogen atom having an atomic weight not exceeding about 79.91,

b. when Z_1 and Z_3 are each H or F, each of Z_2 and Z_4 may additionally be selected from the group consisting of $—CF_2X_b$, $—Y_1—OY_2$, $—Y_1—Y_3$ and $—O—Y_4$ wherein X_b is an alkyl radical having from 1 to 8 carbon atoms, or a haloalkyl radical having from 1 to 8 carbon atoms in which haloalkyl radical the halogen atoms have an atomic weight not exceeding about 79.91; Y_1 is a saturated divalent alkylene bridging group or a saturated divalent haloalkylene bridging group in which the halogen atoms have atomic weights not exceeding about 79.91; Y_2 is a member selected from the group consisting of H and alkyl; Y_3 is aryl and Y_4 is alkyl,

c. Z_2 and Z_4 and Z_1 and Z_3 may be joined together to form a cycloaliphatic ring system;

4. M is a member selected from the group consisting of H or CH_3,

5. *m* is an integer from 1 to 40; and

6. *n* is an integer from 0 to 40, with the proviso that the terminal carbon atom in the $—(Z_1Z_2C — CZ_3Z_4)—$ group which is bonded to the —O— atom is additionally bonded to two hydrogen atoms; and

B. 5% to 50% by weight of a monomer of the following structure:

wherein R is an alkyl group either straight or branched chain, of about 4 to 18 carbon atoms, and wherein the molecular weight of the polymer if from about 100,000 to about 10,000,000 when the polymer is an emulsion polymer, and from about 5,000 to about 300,000 when the polymer is a solution polymer.

3,959,463

HAIR DRESSING COMPOSITIONS CONTAINING A HAIR SUBSTANTIVE QUATERNARY RESIN

Ara Nersesian, Livingston; Fred Hubner, Edison, and Taras Durbak, Irvington, all of N.J., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 270,409, July 10, 1972, Pat. No. 3,876,760, which is a continuation of Ser. No. 868,892, Oct. 23, 1969, abandoned. This application Jan. 24, 1975, Ser. No. 543,843

Int. Cl.² A61K 7/06

U.S. Cl. 424—70 **5 Claims**

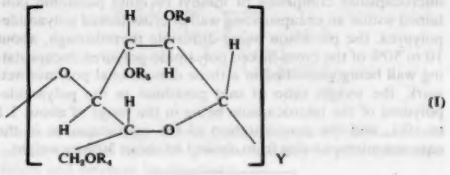
1. A hair dressing composition comprising a hair-fixative quaternary cellulose ether resin having a high affinity for hair and a hair grooming agent dissolved in an aqueous alkyl alcoholic solvent in which the alkyl alcohol has from 2 to 6 carbons wherein:

a. said resin is present in the range of from about 0.1 to 7.0% by weight based on the total weight of the composition;

b. said hair grooming agent is present in the range of from about 1 to 60% by weight based on the total weight of the composition;

c. the ratio of said resin to said hair grooming agent being about 1 part of resin to 10 to 30 parts of grooming agent wherein

said resin is of the formula:

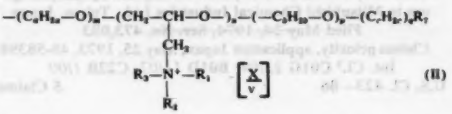


(I)

wherein:

Y indicates the degree of polymerization and is a number from 50 to 20,000;

R_4, R_5 or R_6 is a radical of the formula:



(II)

in which:

a is a whole number 2 or 3;

b is a whole number 2 or 3;

c is a whole number 1 to 4;

m is a number from 0 to 10;

n is a whole number from 0 to 3;

p is a whole number from 0 to 10;

q is zero or 1;

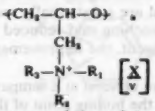
R_7 is H or COOMe group in which Me is H, Na, K or NH_4;

X is a salt forming anion;

v is a number equal to the valence of X;

R_1, R_2 and R_3 are alkyl, aryl, aralkyl, alkaryl, cycloalkyl, alkoxyalkyl or alkoxyaryl in which the alkyl moieties have up to 6 carbon atoms; the aryl moieties having up to 12 carbon atoms and the cycloalkyl moieties having 5 to 6 carbon atoms and wherein two or three of the radicals R_1, R_2 and R_3 may constitute a nitrogen heterocyclic nucleus having 5 to 6 atoms in the nucleus, one atom of which may also be oxygen;

wherein the resin defined by the formula I above contains the quaternary group:



in the average of about 0.1 to 3 quaternary groups per anhydroglucose unit;

and wherein said hair grooming agent is selected from the group consisting of:

a. polyoxypropylene triol having a molecular weight of about 1500;

b. polyoxyethylene glycol having a molecular weight in the range of about 400 to 1000;

c. diisopropyl adipate;

d. diisopropyl sebacate; and

e. protein collagen hydrolysate having a molecular weight in the range of from about 900 to 1500.

3,959,464

MICROENCAPSULATED METHYL AND ETHYL PARATHION INSECTICIDE IN AQUEOUS CARRIER

Chester Blair DeSavigny, Malvern, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed June 3, 1971, Ser. No. 149,816

Int. Cl.² A01N 9/36

U.S. Cl. 424—78 **3 Claims**

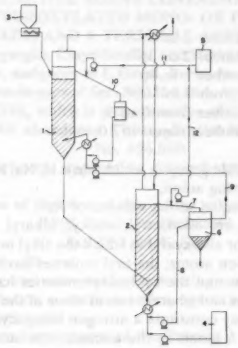
1. A storage-stable, sprayable, aqueous-based insecticidal composition consisting essentially of a mixture in water of

microcapsules comprised of methyl or ethyl parathion contained within an encapsulating wall of cross-linked polyamide-polyurea, the parathion being diffusible therethrough, about 10 to 50% of the cross-linked polyamide-polyurea encapsulating wall being embodied in a three dimensional polymer network, the weight ratio of said parathion to the polyamide-polyurea of the microcapsule being in the range of about 2:1 to 10:1, and the concentration of the microcapsules in the aqueous mixture being from about 1 to about 30% by weight.

3,959,465
PROCESS FOR PREPARING CONCENTRATED TITANIUM MINERAL

Tokuzo Kurata; Satoshi Emi; Kunihiko Ofuchi; Tsutomu Takeuchi, and Isamu Sone, all of Kitakyushu, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed May 24, 1974, Ser. No. 473,083
Claims priority, application Japan, May 25, 1973, 48-58398
Int. Cl.² C01G *23/04;* B01D *11/02;* C22B *1/00*
U.S. Cl. 423—86 **5 Claims**



1. In a process for preparing concentrated titanium materials by reducing a titanium mineral of partical sizes ranging from 50 – 400 microns with a reducing agent such that the iron components of the mineral are substantially reduced to the Fe^{+2} state, and thereafter leaching said reduced titanium mineral with an acid leaching agent, the improvement which comprises:

leaching said reduced titanium mineral at a temperature of at least 80°C, but less than the boiling point of the leaching mixture in the presence of from 0.001 – 5.0% based on the weight of said titanium mineral with at least one polyacrylamide coagulant, whereby the formation of fine particles with a diameter less than 10μ of the titanium mineral is inhibited, and the formation of hard scale by deposition of a precipitate containing mainly TiO_2 is prevented.

3,959,466
HIGHLY ATTENUATED CYTOMEGALOVIRUS VACCINE AND PRODUCTION THEREOF

Stanley A. Plotkin, Philadelphia, Pa., assignor to The Wistar Institute, Philadelphia, Pa.

Filed Apr. 15, 1974, Ser. No. 460,951
Int. Cl.² A61K *39/12;* C12K *5/00*
U.S. Cl. 424—89 **8 Claims**

1. A process for preparing an attenuated cytomegalovirus vaccine comprising serially passaging in WI-38 human diploid lung fibroblasts a strain of cytomegalovirus having a broad antigenic spectrum a sufficient number of times to obtain a strain of cytomegalovrius which produces a substantial amount of cell-free cytomegalovirus, and serially passaging said cell-free cytomegalovirus in WI-38 human diploid lung fibroblasts a sufficient number of times so that the virus, when administered to humans, induces immunity without producing severe symptoms or more than minimal virus excretion and spread to contacts, the total number of passages employed in preparing said vaccine being from about 50 to about 150.

3,959,467
LIPID METABOLISM IMPROVING AND ANTI-ATHEROMATIC AGENT

Mizuho Kobayashi, Gifu, Japan, assignor to Amano Pharmaceutical Co., Ltd., Nagoya, Japan

Division of Ser. No. 329,981, Feb. 6, 1973, Pat. No. 3,875,007, which is a continuation-in-part of Ser. No. 303,312, Nov. 3, 1972, abandoned. This application Mar. 11, 1974, Ser. No. 450,175
Int. Cl.² A61K *35/00*
U.S. Cl. 424—117 **9 Claims**

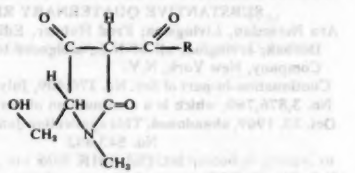
9. A method for ameliorating atherosclerosis in patients have atherosclerosis, comprising administering to said patient lipolytic substance GA-56 in an effective amount sufficient to ameliorate atherosclerosis, said lipolytic substance GA-56 having the following characteristics: (1) it acts specifically on natural fat and oil, chylomicron and low-density lipoprotein to decompose them, (2) optimum pH range is from 7 to 11, (3) optimum temperature is between 40° and 50°C, (4) it suffers no inactivation in 60-minute treatment at 37°C and at pH 4, (5) it suffers substantially little inactivation in the presence of inorganic salts, (6) it is completely free of sugar, (7) its molecular weight is approximately 30,000, (8) its mobility as measured by paper electrophoresis is 1.53×10^{-5} cm², sec^{-1}, v^{-1} (pH=8.7, $\mu = 0.05$), (9) its ultra-violet absorption spectrum is as shown in FIG. 2, (10) its infrared absorption spectrum is as shown in FIG. 1, and (11) its elementary analysis gives C: 47.72% H: 6.85%, O: 26.05%, N: 14.38%, S: 0.35%.

3,959,468
ANTIBIOTIC EQUISETIN AND METHOD OF PRODUCTION

Harland R. Burmeister, Peoria, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 6, 1974, Ser. No. 467,548
Int. Cl.² A61K *35/00*
U.S. Cl. 424—122 **4 Claims**

1. An antibiotic, equisetin, having the following structure:



where R has the emperical formula $C_{15}H_{23}$ and contains three CH_3- groups, two double bonds, and two ring formations; said equisetin being further characterized by the following properties:

a. a nonfluorescent white amorphous powder;
b. the ultraviolet spectrum of FIG. 1;
c. the mass spectrograph of FIG. 2;
d. the infrared spectrum of FIG. 3;
e. a melting point range of 65° to 66° C.;
f. a solubility in acetone of 660 mg./ml., in ethanol of 330 mg./ml., in methanol of 220 mg./ml., in hexane of 0.8 mg./ml., and in water of 0.3 mg./ml.;
g. a molecular weight of 373 g./mole;
h. R_f values of thin layer chromatography using silica gel and the following solvent systems:

acetonitrile:water:benzene (90:6:4, v/v/v) R_f 0.53
toluene:methanol (7:3, v/v) R_f 0.61;

i. a positive ferric chloride test; and
j. the following elemental analysis: C, 70.95; H, 8.39; N, 3.14; 0, 17.52 (by difference).

3,959,469

TRIAZINEDIONE COMPOUNDS AS FUNGICIDAL AND BACTERICIDAL AGENTS

Ian Trevor Kay, Wokingham, England, assignor to Imperial Chemical Industries Limited, London, England

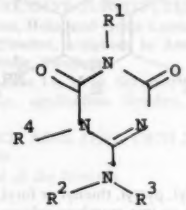
Filed Feb. 3, 1975, Ser. No. 546,318

Claims priority, application United Kingdom, Feb. 15, 1974, 43514/74

Int. Cl.² A01N 9/22

U.S. Cl. 424—249 **2 Claims**

1. A process for combating fungi or bacteria on plants which comprises applying to said fungi or bacteria, a fungicidally or bactericidally effective, but non-phytotoxic, amount of a triazine derivative of the formula:



wherein R^1 is alkyl of from 1 to 8 carbon atoms, allyl, adamentyl, chlorophenyl, or cyclohexyl; R^2 is alkyl of from 1 to 4 carbon atoms or toether with R^3 and the adjacent N-atom forms a pyrrolidine ring; R^3 is hydrogen, alkyl of from 1 to 4 carbon atoms, alkoxy of from 1 to 4 carbon atoms, phenyl or amino; and R^4 is hydrogen or alkyl of from 1 to 4 carbon atoms; or alkali metal, alkaline earth metal, ammonium or amine salt.

3,959,470

PSYCHOTROPIC MEDICINAL PREPARATION

Mikhail Davidovich Mashkovsky, Leningradsky prospeket, 75a, kv. 55; Robert Georgievich Glushkov, ulitsa Gorkogo, 43, kv. 90; Natalia Ivanovna Andreeva, Frunzenskaya Naberzhnaya, 54, kv. 8; Anatoly Bolesiavovich Smulevich, Chernomorsky bulvar, 23, korpus 1, kv. 63; Grigory Yakovlevich Avrutsky, ulitsa Junykh Lenintsev, 102, kv. 36, and Valentina Vasilievna Gromova, ulitsa Dubininskaya, 11/17, kv. 183, all of Moscow, U.S.S.R.

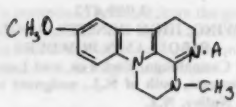
Continuation of Ser. No. 415,170, Nov. 12, 1973, abandoned. This application Mar. 10, 1975, Ser. No. 557,189

Claims priority, application U.S.S.R., Nov. 28, 1972, 1850615

Int. Cl.² A61K 31/495

U.S. Cl. 424—250 **7 Claims**

1. A psychotropic medicinal preparation comprising a therapeutically effective amount of an active principle which is a salt of 3-methyl-8-methoxy-3H,1,2,5,6-tetrahydropyrazino-[1,2,3]-ab- -carbolin of the following formula:



where A is an inorganic or organic acid, and a pharmaceutical carrier selected from the group consisting of pharmaceutical fillers and solvents for injections.

3,959,471

4,6-DIARYL-PYRIMIDIN-2(1H)-ONES AS TRANQUILIZERS

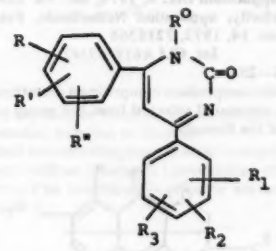
Goetz E. Hardtmann, Florham Park, and Faizulla G. Kathawala, West Orange, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 385,402, Aug. 3, 1973, Pat. No. 3,892,860, which is a division of Ser. No. 172,583, Aug. 17, 1971, Pat. No. 3,772,272, which is a continuation-in-part of Ser. No. 37,341, May 14, 1970, abandoned, which is a continuation-in-part of Ser. No. 878,575, Nov. 20, 1969, abandoned. This application Mar. 24, 1975, Ser. No. 561,486

Int. Cl.² A61K 31/505

U.S. Cl. 424—251 **5 Claims**

1. The method of tranquilizing a mammal comprising administering to a mammal in need of tranquilization a tranquilizing effective amount of a compound of the formula:



wherein

R^o is alkyl of 1 to 5 carbon atoms,

each of R and R'' is independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 3 carbon atoms or alkoxy of 1 to 3 carbon atoms,

R' is hydrogen, fluoro, chloro, bromo, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, nitro or trifluoromethyl,

each of R_1 and R_3 is independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 3 carbon atoms or alkoxy of 1 to 3 carbon atoms, and

R_2 is hydrogen, fluoro, chloro, bromo, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, nitro or trifluoromethyl, provided that no more than one of R, R' and R'' and no more than one of R_1, R_2 and R_3 is a branched chain substituent.

3,959,472

FREE-FLOWING, HIGH DENSITY, AGGLOMERATED RIBOFLAVIN POWDERS

Marco Alfred Cannalonga, Fort Lee, and Louis Vincent Czarecki, Succasunna, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 242,789, April 10, 1972, abandoned. This application June 26, 1974, Ser. No. 483,469

Int. Cl.[2] A61K *31/525*

U.S. Cl. 424—252 1 Claim

1. A spray-dried, free-flowing, non-dusting, static-free riboflavin powder composition comprising, in percents by weight based on the total weight of the powder, from about 45 to about 65% of riboflavin, from about 15 to about 25% of oyster shell flour as a non-absorbent inorganic filler, from about 15 to about 35% of a hydrolyzed cereal flour and from about 1 to about 5% of silicic acid; said composition in the form of agglomerated particles having a bulk density of 35–36 pounds per cubic foot.

3,959,473

QUINOLINE DERIVATIVES HAVING PHARMACOLOGICAL EFFECTS

Theodorus Antonius Cornelis Boschman, and Jacob Gerard Korsloot, both of Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

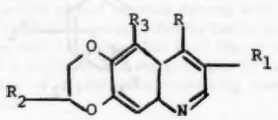
Division of Ser. No. 329,692, Feb. 5, 1973, Pat. No. 3,865,832. This application Dec. 4, 1974, Ser. No. 529,291

Claims priority, application Netherlands, Feb. 9, 1972, 7201675; Nov. 14, 1972, 7215366

Int. Cl.[2] A61K *31/47*

U.S. Cl. 424—258 36 Claims

1. A diuretic composition comprising a diuretically effective dosage of a compound selected from the group consisting of quinolines of the formula



wherein R is hydroxy, R_3 is a substituent selected from the group consisting of hydrogen, halogen, trifluromethyl and nitro, R_1 is a substituent selected from the group consisting of alkoxycarbonyl, alkoxyalkoxycarbonyl, and carboxyl and R_2 is a substituent selected from the group consisting of alkoxyalkyl, alkoxyalkoxyalkyl, alkenylalkoxy, cycloalkylalkoxy and cycloalkenylalkoxy each of up to 6 carbon atoms and hydroxy alkyl of up to 4 carbon atoms, alkali metal salts thereof, tautomers thereof and acid addition salts thereof formed with pharmaceutically acceptable acids with the proviso that the number of carbons in the substituents defined by R_1 is at most four when R_2 is a substituent other than halogen or trifluoromethyl and is six when R_2 is halogen or trifluromethyl and a pharmaceutically acceptable carrier therefor.

3,959,474

2,6-DIAMINO-1,4-DIHYDROPYRIDINE-3,5-DICARBOXYLIC ACID ESTERS USED AS CORONARY VESSEL DILATORS AND ANTI-HYPERTENSIVE AGENTS

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

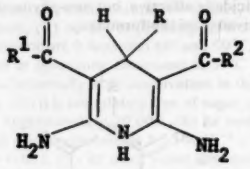
Division of Ser. Nos. 454,997, March 27, 1974, Pat. No. 3,887,558, and Ser. No. 455,257, March 27, 1974, Pat. No. 3,860,601, which is a division of Ser. No. 336,483, Feb. 28, 1973, Pat. No. 3,855,231. This application Nov. 13, 1974, Ser. No. 523,357

Claims priority, application Germany, Mar. 6, 1972, 2210687

Int. Cl.[2] A61K *31/455*

U.S. Cl. 424—266 9 Claims

1. A pharmaceutical composition useful for effecting coronary vessel dilation and treating hypertension in humans and animals which comprises a coronary vessel dilating amount or an antihypertensive amount of a compound of the formula:



wherein R is pyridyl, pyrryl, thienyl or furyl, unsubstituted or substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy and halogeno; and

each of R^1 and R^2, taken independently of the other, is lower alkoxy, lower alkoxy(lower alkoxy), alkenyloxy of 2 to 4 carbon atoms, alkynyloxy of 2 to 4 carbon atoms, amino, lower alkylamino or di(lower alkyl)amino,

in combination with a pharmaceutically acceptable non-toxic inert carrier.

3,959,475

SUBSTITUTED 1,3-DIHYDROSPIRO(ISOBENZOFURAN)S

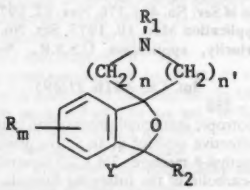
Victor J. Bauer, Somerville, and Raymond W. Kosley, Jr., Convent, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 424,117, Dec. 12, 1973, abandoned. This application Sept. 3, 1974, Ser. No. 502,650

Int. Cl.[2] C07D *491/10*

U.S. Cl. 424—267 48 Claims

1. A compound of the formula



in which

R is hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, trifluoromethyl, halogen, hydroxy, or methylenedioxy;

R_1 is hydrogen, alkyl of 1 to 6 carbon atoms, cycloalkylalkyl of 4 to 8 carbon atoms, alkenyl of 3 to 6 carbon atoms, phenylalkyl of the formula $(CH_2)_x$—PhR, diphenylalkyl of the formula $(CH_2)_m$—$CH(PhR)_2$, diphenylmethoxyalkyl of the formula —$(CH_2)_m$—$OCHPh_2$, alkanoyl of 2 to 6 carbon atoms, phenylalkanoyl of the formula —$CO(CH_2)_x$—PhR, benzoyl of the formula —COPhR, benzoylalkyl of the formula —$(CH_2)_m$—COPhR, phenylhydroxyalkyl of the formula —$(CH_2)_m$CHOHPhR, alkoxycarbonyl of 2 to 6 carbon atoms, phenyloxycarbonyl, or cycloalkylcarbonyl of 4 to 8 carbon atoms;

R_2 is alkyl of 1 to 6 carbon atoms or phenyl of the formula PhR_m;

Y is hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, hydroxy or phenyl of the formula PhR;

Ph is phenyl;

m, *n* and *n'* are integers from 1 to 3, the sum of *n* and *n'* being from 3 to 5; and

x is an integer from 1 to 4, and

the optical antipodes and the pharmaceutically acceptable acid addition salts thereof.

3,959,476
ANTIHYPERTENSIVE SUBSTITUTED TRIAZOLES

Hans Erik Eriksson, Holo, and Gosta Lennart Florvall, Sodertalje, both of Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

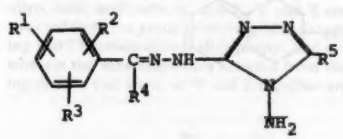
Filed June 11, 1974, Ser. No. 478,228

Claims priority, application Sweden, June 14, 1973, 73083651

Int. Cl.² A61K *31/41*; C07D *249/08*

U.S. Cl. 424—269 **7 Claims**

1. A compound of the formula



I

or a pharmaceutically acceptable salt thereof in which formula R^1, R^2 and R^3 are the same or different and each represents a hydrogen atom, a lower alkyl group or a halogen atom, R^4 represents a hydrogen atom or a lower alkyl group and R^5 represents a hydrogen atom or a lower alkyl group, provided that R^4 is a lower alkyl group when R^1, R^2 and R^3 are all hydrogen.

3,959,477
METHODS OF PROTECTION AGAINST EMESIS IN MAMMALS BY ADMINISTRATION OF A HETEROCYCLIC BENZAMIDE

Michel Leon Thominet, Paris, France, assignor to Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France, Paris, France

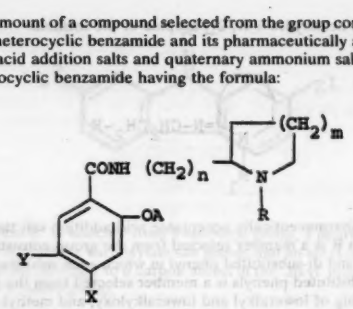
Division of Ser. No. 382,251, July 24, 1973, Pat. No. 3,891,671, which is a continuation of Ser. No. 145,871, May 21, 1971, abandoned, which is a continuation-in-part of Ser. No. 845,523, July 28, 1969, abandoned. This application Mar. 24, 1975, Ser. No. 561,253

Claims priority, application France, Aug. 1, 1968, 68.161593; Oct. 29, 1968, 68.171761

Int. Cl.² A61K *31/445*

U.S. Cl. 424—274 **8 Claims**

1. A method of protection a mammal against emesis which comprises administering to said mammal an anti-emetic effective amount of a compound selected from the group consisting of a heterocyclic benzamide and its pharmaceutically acceptable acid addition salts and quaternary ammonium salts, said heterocyclic benzamide having the formula:



in which A is allyl or lower alkyl; R is allyl or lower alkyl; X is hydroxy; Y is halogen, *m* is a whole number less than 3 and n is a whole number less than 4.

3,959,478
INSECTICIDAL 2-PHENYL-4-BENZOYL-1,2,4-OXADIAZOLIDINE-3,5-DIONES

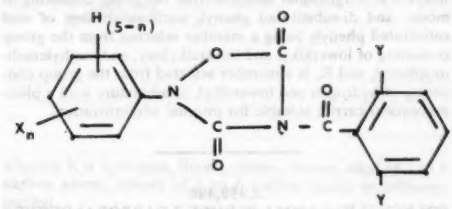
Sidney B. Richter, Chicago; Leonard J. Stach, Riverside, and Robert N. Wilke, Chicago, all of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Mar. 17, 1975, Ser. No. 558,577

Int. Cl.² C07D *271/06*

U.S. Cl. 424—272 **9 Claims**

1. A compound of the formula



wherein X is chlorine or fluorine; *n* is an integer from 1 to 3; and Y is chlorine, bromine or fluorine.

8. A method of controlling insects which comprises contacting said insects with an insecticidal composition comprising an inert carrier and an insecticidally effective amount of a compound of claim 1.

3,959,479
ANTI-ANGINAL ACTIVITY OF 2-ARALKYLIMINO-AZEPINES

George Ireland Poos, Ambler, Pa., assignor to McNeil Laboratories, Inc., Fort Washington, Pa.

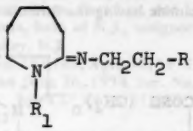
Continuation-in-part of Ser. No. 253,711, May 16, 1972, abandoned, which is a continuation-in-part of Ser. No. 85,733, Oct. 30, 1970, abandoned, which is a division of Ser. No. 738,379, June 17, 1968, abandoned, which is a continuation-in-part of Ser. No. 649,812, June 29, 1967, abandoned, which is a continuation-in-part of Ser. No. 409,563, Nov. 6, 1964, abandoned. This application Apr. 26, 1974, Ser. No. 464,404

Int. Cl. A61k *33/32*, *31/36*

U.S. Cl. 424—282 **22 Claims**

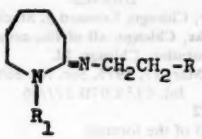
1. A pharmaceutical composition in dosage unit form comprising per dosage unit from about 5 to about 500 mg of a member selected from the group consisting of a 2-aralk-

ylimino-hexahydro-1-R_1-2H-azepine of the formula:



and a pharmaceutically acceptable acid addition salt thereof, wherein R is a member selected from the group consisting of mono- and di-substituted phenyl in which each substituent of said substituted phenyls is a member selected from the group consisting of loweralkyl and loweralkyloxy, and methylenedioxyphenyl, and R_1 is a member selected from the group consisting of hydrogen and loweralkyl, in admixture with a pharmaceutical carrier suitable for internal administration.

13. The method of treating a warm blooded animal having angina pectoris which comprises systemically administering to said warm blooded animal an effective anti-anginal amount of a member selected from the group consisting of a 2-aralkylimino-hexahydro-1-R_1-2H-azepine of the formula:



and a pharmaceutically acceptable acid addition salt thereof, wherein R is a member selected from the group consisting of mono- and di-substituted phenyl, each substituent of said substituted phenyls being a member selected from the group consisting of loweralkyl and loweralkyloxy, and methylenedioxyphenyl, and R_1 is a member selected from the group consisting of hydrogen and loweralkyl, in admixture with a pharmaceutical carrier suitable for internal administration.

3,959,480

POLYCYCLIC GAMMA-PYRONE-3-CARBOXALDEHYDE DERIVATIVES

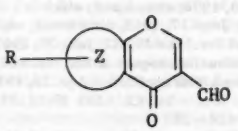
Daniel Kaminsky, deceased, late of Parsippany, N.J. (by Bernice R. Kaminsky, administratrix); Sylvester Klutchko, Hackettstown, and Maximilian von Strandtmann, Rockaway, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 480,647, June 19, 1974, Pat. No. 3,887,585, which is a continuation-in-part of Ser. No. 352,135, April 18, 1973, abandoned. This application Feb. 3, 1975, Ser. No. 546,587

Int. Cl.[2] A61K *31/35*

U.S. Cl. 424—283 **2 Claims**

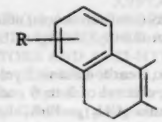
1. A method for preventing asthmatic symptoms in a mammal in need thereof which comprises the administration of an effective amount of a compound of the formula I:



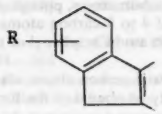
I

wherein R represents hydrogen, hydroxy, lower alkyl, or lower alkoxy and the Z ring has one of the following structures:

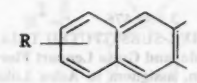
(a)



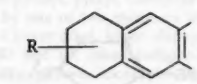
(b)



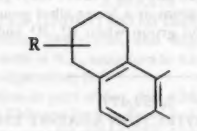
(c)



(d)

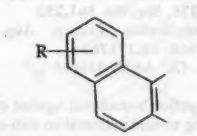


(e)



or

(f)



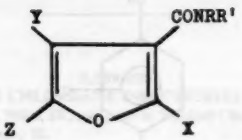
3,959,481

METHOD OF PROTECTING PLANTS FROM FUNGAL DISEASES USING FURAN-3-CARBOXAMIDE DERIVATIVES

Robert A. Davis, Cheshire; Bogislav von Schmeling, Hamden, both of Conn.; Ethel E. Felauer, and Marshall Kulka, both of Guelph, Canada, assignors to Uniroyal, New York, N.Y.

Filed Feb. 13, 1969, Ser. No. 799,110
Int. Cl.[2] A01N *9/28*
U.S. Cl. 424—285 15 Claims

1. A method of protecting plants from fungal diseases comprising contacting the fungus with a fungicidally effective amount of a compound of the formula:



wherein R is selected from the group consisting of hydrogen, alkyl containing from 1 to 10 carbon atoms, benzoyl and trichloromethylsulfenyl; R' is selected from the group consisting of hydrogen, alkyl containing 1 to 10 carbon atoms, alkenyl containing 2 or 3 carbon atoms, cyclohexyl, naphthyl, benzyl, pyridyl, thiazolyl, ethylene bis-, N-furylmethyl, phenyl, biphenylyl, and substituted phenyl wherein the substituents are selected from the group consisting of methyl, methoxy, nitro, halo, and carboxy, and X, Y and Z are independently selected from the group consisting of hydrogen, alkyl containing 1 to 17 carbon atoms, allyl, phenyl, and substituted phenyl wherein the substituents are selected from the group consisting of halo and nitro, or Y and Z together are 1,4-butylene.

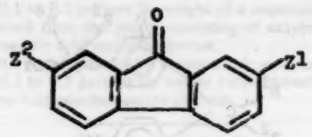
3,959,482

FLUORENONE CARBOXYLIC ACIDS FOR THE PREVENTION OF THE SYMPTOMS OF ASTHMA AND ALLERGIN RHINITIS

Harold Francis Hodson, Hayes, and John Frederick Batchelor, Beckenham, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Sept. 7, 1972, Ser. No. 287,042
Claims priority, application United Kingdom, Sept. 8, 1971, 41852/71; Feb. 24, 1972, 8608/72; Mar. 29, 1972, 14909/72
Int. Cl.[2] A61K *31/275*
U.S. Cl. 424—304 13 Claims

1. A method of preventing the symptoms of asthma or allergic rhinitis in a mammal having asthma or allergic rhinitis which comprises administering to said mammal a prophylactically effective amount of a compound of the formula



wherein Z^1 is selected from a carboxyl group, a pharmaceutically acceptable carboxylate salt group, and an alkyl carboxylate group having 1 to 6 carbon atoms in the 'alkyl' moiety, and Z^2 is a cyano group.

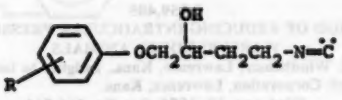
3,959,483

PHENOXY-4-ISOCYANO-BUTAN-2-OLS

Goetz E. Hardtmann, Morristown, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Aug. 22, 1975, Ser. No. 606,930
Int. Cl.[2] A61K *31/275*; C07C *121/75*
U.S. Cl. 424—304 10 Claims

1. A compound of the formula:



wherein R is hydrogen, fluoro, chloro, bromo, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms or trifluoromethyl.

9. The method of sedating a mammal comprising administering a sedating effective amount of compound of claim 1.

3,959,484

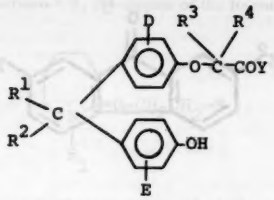
PHENOXY CARBOXYLIC ACID DERIVATIVES AS ANTI-ATHEROSLEROSIS AGENTS

Yasushi Nakamura, Iberagi; Kunio Agatsuma, Takaresuka; Yoshihiro Tanaka, Takaresuka, and Shunji Aono, Toyonake, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 206,966, Dec. 10, 1971, Pat. No. 3,821,404, which is a division of Ser. No. 26,412, April 7, 1970, Pat. No. 3,716,583. This application Apr. 10, 1974, Ser. No. 459,861
Claims priority, application Japan, Apr. 16, 1969, 44-29905; Apr. 16, 1969, 44-29907; May 2, 1969, 44-34166; May 2, 1969, 44-34167; Oct. 3, 1969, 44-80041; Oct. 3, 1969, 44-80042; Dec. 19, 1969, 45-102809; Dec. 23, 1969, 45-104194
Int. Cl.[2] A61K *31/235*
U.S. Cl. 424—308 16 Claims

1. A method for lowering an elevated cholesterol or lipid level in a human adult, which comprises

orally administering thereto an effective cholesterol or lipid lowering amount of a phenoxyaliphatic carboxylic acid derivative of the formula



wherein D and E each are hydrogen; and

R^1 and R^2 each are methyl, or R^1 and R^2 may form cyclohexylidene together with a carbon atom bonded therewith;

R^3 is methyl;

R^4 is methyl, ethyl or n-propyl; and

Y is hydroxyl or ethoxy, provided that Y is hydroxyl when R^1 and R^2 form cyclohexylidene together with a carbon atom bonded therewith and R^4 is methyl or n-propyl, and Y is ethoxy when R^1 and R^2 each are methyl and R^4 is ethyl.

3,959,485

METHOD OF REDUCING INTRAOCULAR PRESSURE IN WARM-BLOODED ANIMALS

John J. Windheuser, Lawrence, Kans., assignor to Interx Research Corporation, Lawrence, Kans.

Filed Apr. 10, 1975, Ser. No. 566,744

Int. Cl.² A61K *31/22*

U.S. Cl. 424—311 **7 Claims**

1. A method for lowering elevated intraocular pressure in a warm-blooded animal suffering from glaucoma which comprises topically administering to the eye thereof, a therapeutically effective amount of a compound selected from the group consisting of 3,4-dipivaloxy-α-[(isopropylamino)methyl]benzyl alchohol or a nontoxic pharmaceutically acceptable acid addition salt thereof.

3,959,486

METHOD FOR PRODUCING β-ADRENERGIC BLOCKAGE WITH ALKANOLAMINE DERIVATIVES

David James Le Count, Congleton, and Christopher John Squire, Cheadle Hulme, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 145,897, May 21, 1971, abandoned. This application Jan. 7, 1974, Ser. No. 431,297

Claims priority, application United Kingdom, May 27, 1970, 25529/70; Nov. 20, 1970, 55246/70

Int. Cl.² A61K *31/165*

U.S. Cl. 424—324 **2 Claims**

1. A method for the treatment of angina pectoris, cardiac arrythmias, hypertension or phaeochromocytoma in a warm blooded animal in need of such treatment which comprises administering orally or intravenously to said animal an effective amount of the compound 1-t-butylamino -3-(o-N-methylcarbamoylmethoxyphenoxy) propan-2-ol or a non-toxic,039590773 pharmaceutically acceptable acid addition salt thereof.

3,959,487

CONTROL OF MITES WITH POLYCHLORO PARATHIO PHENOLS

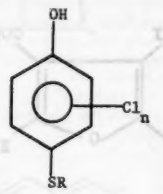
William E. Bissinger, Akron; Donald E. Hardies, Wadsworth, and Jerome M. Lavanish, Akron, all of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 288,220, Sept. 11, 1972, Pat. No. 3,850,609, which is a division of Ser. No. 766,651, Sept. 28, 1970, Pat. No. 3,723,538. This application July 26, 1974, Ser. No. 492,086

Int. Cl.² A01N *9/00, 9/22*

U.S. Cl. 424—337 **5 Claims**

1. A method of killing mites which comprises applying to the mites a miticidal amount of a compound represented by the structural formula:



wherein:

n is 3 or 4; and

R is selected from the group consisting of lower alkyl containing from 1 to 8 carbon atoms, lower alkenyl containing from 3 to 8 carbon atoms, and lower cycloalkyl containing from 3 to 8 carbon atoms.

3,959,488

1-SUBSTITUTED BIGUANIDES FOR TREATING HYPERACIDITY OR ULCERATION

Julius Diamond, Lafayette Hill; George H. Douglas, Paoli, and Bernard J. Burns, Philadelphia, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 189,195, Oct. 14, 1971, Pat. No. 3,800,043, which is a continuation-in-part of Ser. No. 89,005, Nov. 12, 1970, abandoned. This application Dec. 6, 1973, Ser. No. 422,454

Int. Cl.² A01N *9/20*

U.S. Cl. 424—326 **6 Claims**

1. A method of treating gastrointestinal hyperacidity or ulceration in a human or mammal in need thereof, which comprises the oral or parenteral administration of an effective gastric anti-ulceration or anti-secretory amount of 1-(2-iodo-4-methylphenyl)biguanide.

3,959,489

POLYBUTYL-2-CINNAMYLPHENOLS AS INSECT ANTIPROCREANTS

Leonard Jurd, Berkeley, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

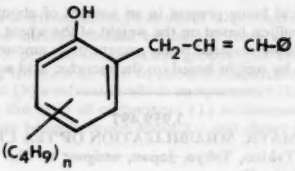
Filed Mar. 24, 1975, Ser. No. 561,583

Int. Cl.² A01N *9/26*

U.S. Cl. 424—346 **8 Claims**

1. A method of inhibiting oviposition in flies, which comprises

providing for ingestion by the flies a compound of the structure



wherein *n* is 2 or 3,

said compound being provided in an amount insufficient to kill the flies but sufficient to inhibit oviposition therein.

3,959,490

GRANULAR CHLORDANE INSECTICIDAL PROCESS

Leo Trademan, Niles, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 401,099, Sept. 26, 1973, Pat. No. 3,886,286, which is a continuation-in-part of Ser. No. 200,597, Nov. 19, 1971, abandoned. This application Dec. 20, 1974, Ser. No. 534,543

The portion of the term of this patent subsequent to May 27, 1992, has been disclaimed.

Int. Cl.² A01N *9/30, 9/32*

U.S. Cl. 424—352 **5 Claims**

1. A method for preparing a free-flowing granular technical chlordane insecticidal composition which comprises incorporating from about 0.5 to about 5.0 percent by weight of the composition of magnesium stearate or aluminum stearate onto a granular inert carrier having adsorbed thereon an insecticidally-effective amount of technical chlordane.

3,959,491

STABLE HUMAN SKIN COSMETIC COMPOSITION CONTAINING MILK

Henry Y. Young, Delmar, N.Y., and Edward Henderson, deceased, late of New York, N.Y. (by Kathryn S. Henderson, executrix), assignors to Stiefel Laboratories, Inc., Oak Hill, N.Y.

Filed Oct. 29, 1974, Ser. No. 518,808

Int. Cl.² A61K *7/48*

U.S. Cl. 424—359 **8 Claims**

1. A cosmetic composition for topical application to human skin comprising

from 40 to 80 percent by weight sterilized fluid milk containing from about 7 to 18 percent milk fats, from about 8 to 11 percent non-fat solids and the balance essentially water,

from 1 to 5 percent by weight of at least one acidifier and buffer which is a fatty acid having from 12 to 20 carbon atoms,

from 2.5 to 10.0 percent by weight of at least one emulsifier and stabilizer which is a triglyceride ester of a saturated fatty acid having from 16 to 18 carbon atoms,

from 5 to 15 percent by weight of at least one alkyl ester of a saturated fatty acid in which the alkyl radical has from 2 to 18 carbon atoms and the fatty acid has from 12 to 20 carbon atoms,

from 5 to 15 percent by weight of at least one stabilizer which is a alkane diol having from 2 to 6 carbon atoms,

from 0.1 to 0.5 percent by weight of a sequestering agent selected from the group consisting of ethylenediamine tetraacetic acid and salts thereof,

from 0.1 to 0.5 percent by weight sorbic acid, and

from 0.3 to 0.5 percent by weight 1-(3-chloroallyl)-3,5,7-triaza-1-azoniaadamantane chloride.

3,959,492

METHOD FOR REDUCING SERUM BLOOD CHOLESTEROL

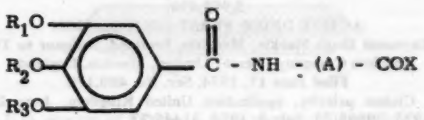
Frederick Coulston, Schenectady, and Ira Rosenblum, Rensselaer, both of N.Y., assignors to Istituto Chemioterapico Italiano, Milan, Italy

Division of Ser. No. 313,344, Dec. 8, 1972, Pat. No. 3,873,273. This application Jan. 10, 1975, Ser. No. 539,955

Int. Cl.² A61K *31/165*

U.S. Cl. 424—324 **1 Claim**

1. A method for reducing serum blood cholesterol comprising administering to a warm-blooded animal in which lowering of the serum blood cholesterol is desired an effective amount of a compound having the formula:



wherein R_1, R_2, and R_3 are hydrogen, methyl, ethyl, or propyl, and A is a saturated hydrocarbon radical substituted with one carboxylic acid group and containing 2 to 8 carbon atoms, and X is $—NH_2$.

3,959,493

RUMEN BYPASS PRODUCTS COMPRISING BIOLOGICALLY ACTIVE SUBSTANCES PROTECTED WITH ALIPHATIC FATTY ACIDS

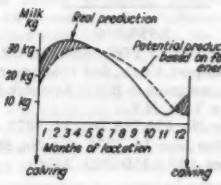
Nils-Ivar Baalsrud; Svein Ore, both of Oslo, and Weiert Velle, Blommenholm, all of Norway, assignors to Rumen Chemie, AG, Glarus, Switzerland

Continuation of Ser. No. 235,675, March 17, 1972, abandoned. This application Sept. 18, 1974, Ser. No. 507,201

Claims priority, application Norway, Mar. 17, 1971, 1031/71; Mar. 17, 1971, 1030/71; June 6, 1971, 2115/71; Sept. 24, 1971, 3545/71

Int. Cl.² A23K *1/18*

U.S. Cl. 426—2 **15 Claims**



2. A method of administering to a ruminant a biologically active substance useful in the post rumen portion of the digestive tract of a ruminant, said biologically active substance

being subject to chemical reaction in the presence of the rumen content or having an undesired effect on the processes normally taking place in the rumen, said biologically active substance being selected from the group consisting of nutrients and medicaments;

said method comprising orally administering to a ruminant a rumen by-pass product comprising a plurality of particles each having a minimum dimension of 0.2 mm. and a specific gravity of 0.8–1.4, each of said particles comprising:

up to 40% by weight of said biologically active substance; and

a protective substance substantially resistant to rumen environment present in an amount of at least 60% by weight of said particle and sufficient to prevent release of said biologically active substance to any substantial degree in the rumen when said particle is in a rumen, said protective substance being digestible lower down the digestive tract of said ruminant to release said biologically active substances therein, said protective substance being present at the surface of said particle and consisting essentially of a mixture of saturated and unsaturated unsubstituted aliphatic fatty acids having from 14–22 carbon atoms, said unsaturated acids being present in an amount of up to 30% by weight of said mixture.

3,959,494

ACTIVE DRIED YEAST COMPOSITION

Raymond Denis Starkie, Menstrie, Scotland, assignor to The Distillers Company (Yeast) Limited, Morden, England

Filed June 17, 1974, Ser. No. 480,178

Claims priority, application United Kingdom, June 22, 1973, 29802/73; July 2, 1973, 31445/73

Int. Cl.² A21D *2/16, 2/14*

U.S. Cl. 426—19 **13 Claims**

1. A storage stable dry composition from which dough can be formed by merely mixing with water and comprising a dry mixture of (a) flour and (b) mixture formed by intimately mixing predried active dried powdered yeast and edible fat or oil in which the proportion by weight of yeast dry matter content to edible fat or oil is from 1:4 to 10:1.

3,959,495

RECONSTITUTION OF DRY YEAST IN DOUGH PREPARATION

John L. Lee, Menstrie, Scotland, assignor to The Distillers Company (Yeast) Limited, Morden, England

Filed July 22, 1974, Ser. No. 490,444

Claims priority, application United Kingdom, July 23, 1973, 34947/73

Int. Cl.² A21D *2/16*

U.S. Cl. 426—24 **5 Claims**

1. A process for making a dough comprising mixing active dried yeast, flour and water in which the yeast is, before being mixed with the bulk of the flour to form dough, added to and reconstituted in an emulsion in water of an ester of polyglycerol with a saturated fatty acid.

3,959,496

OXIDIZING AGENT FOR MAKING BREAD

Simon S. Jackel, Westport, Conn., and Volodymyr R. Diachuk, Rutherford, N.J., assignors to Baker Research Development Service, Inc., New York, N.Y.

Continuation of Ser. No. 424,785, Dec. 14, 1973, abandoned. This application June 26, 1975, Ser. No. 590,555

Int. Cl.² A21D *2/22, 2/04*

U.S. Cl. 426—25 **27 Claims**

1. In a bread dough including wheat flour, water, leavening and an oxidizing agent, the improvement wherein said oxidizing agent comprises particles of ascorbic acid coated with and encapsulated within a coating of an edible, water insoluble material having a melting point of from 130°F to 155°F, said ascorbic acid being present in an amount of about 5 to 200 parts per million based on the weight of the wheat flour, said water insoluble material being present in an amount of about 5 to 200% by weight based on the ascorbic acid weight.

3,959,497

ENZYMATIC SOLUBILIZATION OF TEA CREAM

Yoshinori Takino, Tokyo, Japan, assignor to The Coca-Cola Co., Atlanta, Ga.

Filed July 30, 1970, Ser. No. 54,016

Int. Cl.² A23F *3/00*

U.S. Cl. 426—52 **19 Claims**

2. A process of preparing a tea extract which comprises:

a. preparing a hot water extract of black tea,

b. adding tannase to the extract and permitting the tannase to remain in contact with the extract while maintaining said extract at a temperature within the range of about 25° to 55°C for a time sufficient to solubilize a substantial portion of the tea cream therein.

3,959,498

EMULSIFIED OIL AND SUGAR CEREAL COATING AND INCORPORATING SAME

Angus Alexander Lyall, Florenceville, and Robert John Johnston, Niagara Falls, both of Canada, assignors to Nabisco, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 253,137, May 15, 1972, Pat. No. 3,840,685. This application Sept. 20, 1974, Ser. No. 507,955

The portion of the term of this patent subsequent to Oct. 8, 1991, has been disclaimed.

Int. Cl.² A23L *1/00*

U.S. Cl. 426—93 **11 Claims**

1. A coated prepared cereal product which is crisp, nonhydroscopic, and liquid-resistant, the coating being of opaque appearance, said product having a softer texture and being less frangible than conventional candy-coated cereal products, and being further characterized in that said product contains sugar crystals and edible oil-or fat-derived oleaginous material deeply embedded within the cereal structure; said product being prepared by a process which comprises the following steps in sequence:

a. applying to prepared cereal particles a syrupy oil-in-water emulsion having a temperature in the range of from about 170°F to about 240°F., the emulsion consisting essentially of, by weight, based on the total weight of emulsion, 5%–32% of an edible oil-or fat-derived oleaginous material, an aqueous syrup solution containing 60%–85% sugar solids, and 0.5% – 5% of an emulsifier consisting essentially of distilled monoglycerides, the emulsion containing, by weight, from about 9% to about 34% of water, no heating being carried out during the application of said emulsion to said cereal particles; and

b. drying the coated cereal particles at a temperature and for a time sufficient to reduce the moisture content of said coated cereal particles to a level in the range of 2.0% to 3.5% by weight of said particles, while vigorously agitating the particles through the drying step.

3,959,499

LEAVENING COMPOSITION AND STORAGE STABLE CAKE MIXES MADE THEREWITH

Norman E. Harris, Waltham, and Henry G. Russell, Hudson, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 23, 1974, Ser. No. 535,323

Int. Cl.² A21D *10/00*

U.S. Cl. 426—97 **8 Claims**

1. A sodium bicarbonate leavening agent coating composition comprising a mixture of (1) a cellulose ether selected from the group consisting of hydroxypropylmethylcellulose containing from about 4 to about 12 percent of 2-hydroxypro-

pyl groups and from about 19 to about 30 percent of methoxyl groups and methylcellulose containing from about 27.5 to about 31.5 percent of methoxyl groups, (2) ethylcellulose containing from about 45.0 to about 49.5 percent of ethoxyl groups and (3) a solvent in which components (1) and (2) are dissolved, the ratio of component (1) to component (2) in said mixture being between about 4:1 and about 1:4 parts.

3,959,500

PROCESS FOR BLENDED FOOD PRODUCT

Joseph Bergman, Woodland Hills, Calif., assignor to Nagle, Spillman & Bergman, Inc., Los Angeles, Calif.

Filed Aug. 14, 1975, Ser. No. 604,849

Int. Cl.² A23L *1/20*

U.S. Cl. 426—104 **15 Claims**

1. A process for the production of a uniformly blended textured vegetable protein food product comprising the steps of:

a. providing a mixture of flavored textured soy granules, said mixture including 10–15% by weight of bacon-flavored textured soy granules which contain bacon oil

b. mixing the product resulting from step (a) in a blender so as to uniformly blend said textured soy granules together, said mixing taking place at a predetermined speed such that said food particles are uniformly mixed without causing said food particles to be converted into fines;

c. adding about 12–20% by weight dehydrated onion flakes to said mixture; and

d. mixing said onion flakes and said food particles so as to uniformly blend said food particles and said onion flakes together, said mixing taking place at a predetermined speed and for a predetermined length of time such that

i. said onion flakes and soy granules substantially maintain their original particle size, and

ii. oil from said bacon-flavored soy particles are allowed to be coated on and absorbed by said onion flakes.

e. adding about 20–48% by weight of additional food particles to the mixture, said additional food particles consisting of dehydrated vegetables, dehydrated fruit, sunflower seeds, nuts and mixtures thereof.

f. blending said additional food particles and said mixture to obtain a uniform mixture and to allow said oils from said bacon flavored particles to be coated and absorbed by said additional food particles.

3,959,501

MICROBIALLY-STABLE POTATO PRODUCTS AND PROCESS

Mounir A. Shatila, Blackfoot, Idaho, assignor to American Potato Company, Vacaville, Calif.

Division of Ser. No. 159,571, July 2, 1971, abandoned. This application Feb. 7, 1975, Ser. No. 547,841

Int. Cl.² A23B *7/14*; A23L *1/216*

U.S. Cl. 426—269 **23 Claims**

1. A process for preparing room temperature stable gelatinized potato pieces having a water activity above 0.85 comprising uniformly dispersing into said potato pieces from 500–700 parts per million sulfur dioxide by total weight of product, and thereafter maintaining said pieces in an inert environment.

3,959,502

PRESERVATION OF NATURAL INTESTINES

Hubert Jacob Vaessen, Deventer, Netherlands, assignor to H. Vaessen B.V., Deventer, Netherlands

Filed Mar. 18, 1975, Ser. No. 559,578

Claims priority, application United Kingdom, Mar. 21, 1974, 12450/74

Int. Cl.² A22C *13/00*

U.S. Cl. 426—278 **10 Claims**

1. A process for preserving natural intestines, comprising:

passing a mild alkaline or acidic solution into the intestines until sufficiently filled and stretched in diameter to be measured; said mild alkaline or acidic solution having a concentration, and remaining in the intestines for a time sufficient, to cause permanent preservation of the intestines;

selecting or grading the intestines according to their diameter;

emptying the intestines of said solution; and

drying the intestines.

3,959,503

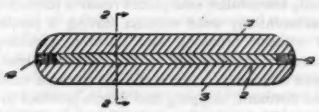
METHOD OF FORMING FRANKFURTERS CONTAINING SEASONING

Reba Lorene Laugherty, P.O. Box 132, Knoxville, Tenn. 37901

Continuation-in-part of Ser. No. 455,956, March 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 301,533, Oct. 27, 1972, abandoned. This application May 12, 1975, Ser. No. 576,747

Int. Cl.² A21D *13/00*; A22C *11/00*

U.S. Cl. 426—283 **3 Claims**



1. A process of forming a meat product by extruding an elongated mass of edible meat material to be divided into frankfurter lengths, comprising depositing an edible sealing substance in the extruded meat material to be disposed at one end of one frankfurter, extruding a mass of edible flavoring material through the meat material concurrently with the extrusion of the latter and throughout substantially the length of the latter where said flavoring material passes substantially through the center of the extruded material, depositing a second mass of edible sealing material in position to be disposed at the opposite end of the frankfurter sealing the flavoring material therein, depositing a third mass of edible sealing material in the extruded meat material adjacent the second mass thereof in position to be disposed at the end of a second frankfurter, squeezing the extruded masses of meat material between the second and third masses of sealing materials to separate the meat material into frankfurter lengths, and continuing the extrusion and depositing to form additional frankfurter lengths each containing a mass of seasoning material substantialy throughout the length thereof sealed at opposite ends.

3,959,504

PEELING ROOT VEGETABLES WITH NaOH AND HOT GAS TREATMENT

Sven-Gunnar Henrik Grufstedt, Kristianstad, Sweden, assignor to AB Svenska Foodco, Fjalkinge, Sweden

Filed Sept. 21, 1973, Ser. No. 399,544

Int. Cl.² A23I *1/10*

U.S. Cl. 426—287 **5 Claims**

1. In a method of peeling root vegetables by treating unpeeled root vegetables during 0.5 to 1 minute with 12–25% aqueous sodium hydroxide at a temperature of about 60°–90°C, followed by heat treatment and then peeling, the improvement wherein said heat treatment comprises (1) drying said root vegetables by means of a drying, hot gas stream of hot air or superheated steam applied at a rate of 1–5 meters per second for 2–5 minutes at a temperature of 100°–150°C to increase and hold the sodium hydroxide concentration on the root vegetable skin at approximately 20–30%, and (2) then withdrawing application of the hot gas stream and maintaining

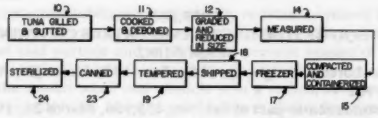
said root vegetables without supplying or removing heat for 3–10 minutes.

3,959,505

METHOD FOR PROCESSING FOOD PRODUCTS

Joseph W. Valiant, II, R.F.D. 1, Box 48, Goode, Va. 24556

Filed Dec. 23, 1974, Ser. No. 535,747
Int. Cl.² A23B 4/06
U.S. Cl. 426—393 **3 Claims**



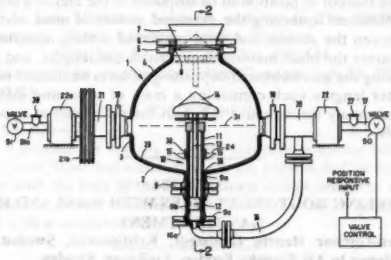
1. The method of preparing and canning tuna fish products comprising the steps of: removing unusable portions from said product at a first installation, cooking the usable portions of the product, measuring a predetermined charge of pieces of said usable portions, equally distributing said charge along a portion of a packaging apparatus, compacting said charge to substantially immobilize said pieces relative to each other and form a substantially solid column having a predetermined diameter without breaking said portions, discharging said column into a container and sealing said container, freezing said column to a temperature sufficient to cause most bacteria to become dormant, shipping said frozen product to a second installation while maintaining the frozen condition of said columns, removing said container from said column, slicing said column into a plurality of segments of predetermined size, placing each segment into a can, sealing said can, and subjecting said can to heat for sterilizing the product within said can.

3,959,506

METHOD FOR PEELING FRUITS AND VEGETABLES

Paul Kunz, 5419 Doettesfeld, Germany

Filed May 13, 1974, Ser. No. 469,613
Claims priority, application Germany, Dec. 6, 1973, 2360886; May 18, 1973, 2325293
Int. Cl.² A23L 1/212; A23N 7/00
U.S. Cl. 426—482 **12 Claims**



1. A method for removing the skins from produce such as tomatoes and peaches, and similar fruits, in which steam is employed in a pressure vessel to heat the layer of the produce directly under the skin thereof, said method comprising first introducing water into said pressure vessel, then loading produce to be skinned into said pressure vessel by way of an inlet opening in the wall of the pressure vessel, whereby the water in the vessel prevents damage to the produce, sealing said pressure vessel inlet opening from the inside thereof by applying pressure to a closure member from the interior of said pressure vessel, increasing the pressure in said vessel by introducing steam into said pressure vessel, maintaining the pressure in said pressure vessel for a period from about 5 to 20 seconds for heating the layer under the skin of said produce sufficiently that boiling will result when the pressure in said pressure vessel is subsequently released, then releasing the pressure in said pressure vessel by opening a steam outlet valve of said pressure vessel to cause said boiling of the layer under the skin of the produce to effect the removal of the skin from the produce, the temperature and pressure of said steam in said pressure vessel being selected so that the steam in said pressure vessel is wet steam.

11. A method for removing the skins from produce such as tomatoes and peaches and similar fruits, in which steam is employed to rapidly heat the layer of produce directly under the skin thereof, said method comprising loading said produce into a pressure vessel by way of an inlet opening adapted to be sealed by a closure member, subsequently closing said inlet opening by applying pressure within said vessel to said closure member, and increasing the pressure in said pressure vessel by introducing hot steam into said pressure vessel, maintaining the pressure in said pressure vessel for a time sufficient to heat the layer under the skin of the produce to a temperature that boiling will result if the pressure in the pressure vessel is released, then releasing the pressure in said pressure vessel to cause the layer under the skin of said produce to boil and thereby to remove the skin from the produce, continuously rotating said pressure vessel during said steps of increasing, maintaining and releasing the pressure in said pressure vessel, said step of releasing the pressure in said pressure vessel comprising first lowering the pressure in said pressure vessel to a value of from 10 to 20% of the maximum pressure in said pressure vessel, then continuing to rotate said pressure vessel from one to three revolutions, and then completely releasing the pressure in said pressure vessel.

3,959,507

CHEMICAL TREATMENT TO SOFTEN THE BONES OF SMALL FISH FOR EDIBLE PURPOSES

Esler L. D'Aquin, 6224 Milne St., New Orleans, La. 70124

Filed Oct. 2, 1970, Ser. No. 77,700
Int. Cl.² A22C 25/00
U.S. Cl. 426—643 **3 Claims**

1. A process for softening the sharp tips of the spines of catfish which consists of soaking gutted catfish in an aqueous solution containing from about 3.14% to 9.42% of hydrogen chloride by weight, at a temperature of from about 40° Fahrenheit to about 80° Fahrenheit for a period of from about 60 minutes to 180 minutes, and thereafter neutralizing the acid soaked catfish using aqueous sodium carbonate.

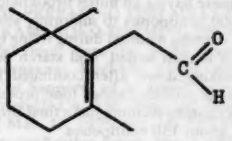
3,959,508

FLAVORING COMPOSITIONS CONTAINING MIXTURE OF 2,2,6-TRIMETHYL-1-CYCLOHEXEN-1-YLACETALDEHYDE AND 2,6,6-TRIMETHYL-1-CROTONYL-1,3-CYCLOHEXADIENE

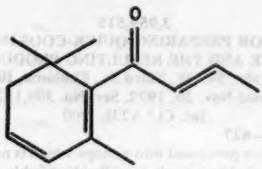
Alan Owen Pittet, Atlantic Highlands; Erich Manfred Klaiber, Neptune; Manfred Hugo Vock, Locust, all of N.J.; Edward J. Shuster, Brooklyn, N.Y., and Joaquin Vinals, Red Bank, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 507,412, Sept. 19, 1974. This application July 24, 1975, Ser. No. 598,654
Int. Cl.² A23L 1/226
U.S. Cl. 426—534 **6 Claims**

1. A composition of matter consisting essentially of 2,6,6-trimethyl-1-cyclohexen-1-ylacetaldehyde having the structure:



and 2,6,6-trimethyl-1crotonyl-1,3-cyclohexadiene having the structure:



the weight ratio of 2,6,6-trimethyl-1-cyclohexen-1-ylacetaldehyde to 2,6,6-trimethyl-1-crotonyl-1,3-cyclohexadiene being in the range of from 1:20 up to 1:1.

3,959,509

FLAVORING FOODSTUFFS USING SULFUR-CONTAINING COMPOUNDS

William John Evers, Middletown; Manfred Hugo Vock, Locust, and Igor Alexander Pelse, Long Branch, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

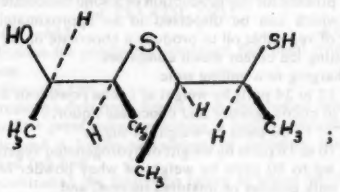
Continuation-in-part of Ser. No. 499,898, Aug. 23, 1974, Pat. No. 3,907,900. This application May 21, 1975, Ser. No. 579,542

The portion of the term of this patent subsequent to July 1, 1992, has been disclaimed.

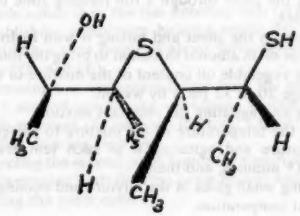
Int. Cl.² A23L *1/226*

U.S. Cl. 426—535 **6 Claims**

1. A process for altering, modifying or enhancing the alliaceous aroma and flavor properties of a foodstuff which comprises adding to said foodstuff from 0.1 ppm up to 30 ppm, based on the weight of the foodstuff, of a sulfur-containing compound having a formula selected from the group consisting of:



and



3,959,510

BEVERAGE CLOUDING AGENTS BASED ON NATURAL GUM RESINS

Stephen M. Felton, New Brunswick, N.J., and Ira B. Kapp, Riverdale, N.Y., assignors to Ira B. Kapp, Riverdale, N.Y.

Continuation-in-part of Ser. No. 290,055, Sept. 18, 1972, abandoned. This application Sept. 11, 1974, Ser. No. 504,946

Int. Cl.² A23L *1/22*

U.S. Cl. 426—548 **29 Claims**

1. A balanced natural gum resin-oil blend suitable for use in the preparation of cloudy still and carbonated beverages, either aqueous or alcoholic, comprising at least one edible natural oil-soluble essentially water-soluble gum resin derived from a plant and having a density of at least about 1.04 g/ml and at leasdt one edible oil, said gum resin being selected from the group consisting of crude and purified damar, colophony, Canada balsam, elemi, and mastic, copaiba, galbanum, labdanum, myrrh, alibanum, opopanax, Peruvian balsam, sandarac, storax, tolu balsam, and gurgun balsam, and said oil being selected from the group consising of citrus oils both natural and synthetic, citrus terpenes, neutal edible oils and non-citrus natural and synthetic flavoring oils, said gum resin being in solution in said oil, the ratio of gum resin to oil being such that the density of the blend approximates that of the beverage to be prepared therefrom, thereby ensuring that the oil containing said natural oil-soluble gum resin dissolved therein will not settle out or form a ring when formulated into a beverage and stored in a container.

17. A dry mix as defined in claim 16, in combination with a suitable quantity of at least one sweetener selected from the group consisting of a saccharine, cyclamates and sugar, powdered color, dry edible acid, dextrose and dry flavor, the combination being termed a beverage powder.

3,959,511

METHOD OF MAKING A DRY FIBROUS MEAT-LIKE PET FOOD AND COMPOSITION THEREOF

Alexander Balaz, Barrington; David P. Bone, Palatine, and Edward L. Shannon, Barrington, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed June 12, 1974, Ser. No. 478,755

Int. Cl.² A23L *1/10*

U.S. Cl. 426—549 **12 Claims**

1. A method for the production of dry pet food containing less than 15 percent by weight moisture having a soft, elastic, meat-like texture and fibrous appearance comprising the steps of:

A. blending a mixture of amylaceous ingredients, fat, a proteinaceous adhesive, and a plasticizing agent with a sufficient amount of water to produce a product having a moisture content of less than 15 percent by weight and an additional amount of process water; wherein said amylaceous ingredients are present in an amount from about 25 to about 50 percent by weight of the final product; said proteinaceous adhesive is present in an amount of from about 10 to about 25 percent by weight of the final product; said plasticizing agent is present in an amount of from about 5 to 25 percent by weight of the final product;

B. heating said mixture at a temperature between 160°F. and 290°F. for a time sufficient to cook said ingredients and extruding the cooked mixture through a die to form an extrudate; and

C. immediately cooling said extrudate by subjecting it to blasts of air; wherein said proteinaceous adhesive is at least one selected from the group consisting of a natural

proteinaceous adhesive and a modified proteinaceous adhesive, said amylaceous ingredient is a foodstuff containing a preponderance of starch or starch-like material, and said plasticizing agent is a plasticizer suitable for food use.

3,959,512

EDIBLE HYPERPROTEINIC DIETETIC PASTE OF HIGH BIOLOGICAL VALUE

Salvatore D'Alessandro, deceased, late of Mormanno (Cosenza), Italy; by Francesco Carlo D'Alessandro, heir, Mormanno (Cosenza), Italy; by Annunziata D'Alessandro, heir, Mormanno (Cosenza), Italy, and by Sandro D'Alessandro, heir, Mormanno (Cosenza), Italy

Continuation-in-part of Ser. No. 483,696, June 27, 1974, abandoned, which is a continuation of Ser. No. 361,644, May 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 86,932, Nov. 4, 1970, abandoned. This application Aug. 1, 1975, Ser. No. 601,069

Claims priority, application Italy, Nov. 7, 1969, 24043/69

Int. Cl.² A23L *1/16*

U.S. Cl. 426—557 **10 Claims**

1. A process for making a dietetic pasta, comprising the steps of:

homogeneously mixing flour with proteins including soluble caseinogen;

kneading the mixture with the addition of milk as an exclusive wetting agent; and

drying the kneaded mixture.

3,959,513

METHOD AND SYSTEM FOR PRODUCING A SOFT FOOD PRODUCT

John W. Strohbach; Robert M. Williams; Jeffrey D. Edwards, and Christopher B. Newcomer, all of Cincinnati, Ohio, assignors to The Kroger Company, Cincinnati, Ohio

Filed Nov. 1, 1974, Ser. No. 520,204

Int. Cl.² A23G *9/20*

U.S. Cl. 426—565 **26 Claims**

1. A system for producing a liquid soft food mix combined with a gas mixture comprising:

a saturation tower,

source means for said liquid soft food mix,

source delivery means connecting said source means to said tower for delivering said mix,

injection means connected to said delivering means for atomizing the delivered mix and injecting the atomized particles into said tower,

means for supplying said gas mixture to said tower at a pressure above atmospheric pressure,

filler means for filling containers with the food mix combined with gas mixture,

filler delivery means connecting said filler means to said tower for delivering liquid mix in the bottom of said tower to said filler means, and

recirculating means for withdrawing mix in the bottom of said tower and injecting the withdrawn mix back into said tower.

3,959,514

SINGLE STEP FILLING METHOD FOR RETORTABLE CANNED FOOD PRODUCTS

James E. Eastman, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed May 28, 1974, Ser. No. 474,300

Int. Cl.² A23L *1/195*, *1/40*

U.S. Cl. 426—589 **18 Claims**

1. In a single step filling method for canning food products, the step of first preparing a uniform blend of a canning medium containing food particles and also containing a modified starch derivative having a degree of substitution of acetyl from about 0.001 to 0.295, said starch derivative being in the form of an aqueous paste having an initial Brookfield viscosity of at least about 2,000 centipoises to uniformly suspend the food particles in the canning medium during filling of an individual container which is then sealed, said starch derivative being capable of breaking down after continued heating in the sealed container to provide canned food products of uniform fill in which the canning medium has a final Brookfield viscosity of less than about 150 centipoises.

3,959,515

PROCESS FOR PREPARING QUICK-COOKING BROWN RICE AND THE RESULTING PRODUCT

Douglas McCabe, 547 W. Third St., Elmhurst, Ill. 60126

Filed Nov. 20, 1972, Ser. No. 308,132

Int. Cl.² A23L *1/00*

U.S. Cl. 426—627 **2 Claims**

1. Brown rice processed into a shape which is not, before or after being boiled by a cook, visually identifiable as being rice in any presently known form, each individual grain prior to boiling by a cook being shrivelled in the sense that a raisin is a shrivelled grape, and with a substantial percentage of the grains broken into several separate, relatively tiny shrivelled bits or pieces of a single grain, all of a medium brown color, and after boiling for 5 minutes with each individual grain and each bit or piece of a grain having an irregular, indeterminate and amorphous shape approximating the appearance of a kernel of cooked oatmeal but with each individual grain and each bit or piece of a grain physically and visually distinct and separate by itself without any tendency to merge into a mushy mass with others.

3,959,516

PROCESS FOR PRODUCING A SOLID CHOCOLATE COMPOSITION SUITABLE FOR COATING ICE CREAM

Brian T. Warkentin, Sunnyvale, Calif., assignor to Shade Foods, Inc., Belmont, Calif.

Continuation-in-part of Ser. No. 501,787, Aug. 29, 1974, abandoned. This application Apr. 14, 1975, Ser. No. 567,508

Int. Cl.² A23G *1/00*

U.S. Cl. 426—631 **2 Claims**

1. A process for the production of a solid chocolate composition which can be dispersed in an approximately equal weight of vegetable oil to produce a chocolate liquid suitable for coating ice cream which comprises

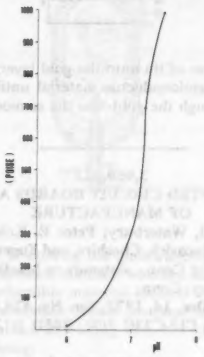
1. charging to a milling zone:
   a. 12 to 24 parts by weight of cocoa powder or a mixture of cocoa powder and chocolate liquor,
   b. 35 to 60 parts by weight of sugar,
   c. 10 to 16 parts by weight of hydrogenated vegetable oil,
   d. up to 10 parts by weight of whey powder or low-fat milk powder or mixtures thereof, and
   e. from 0.2 to 0.4 parts by weight of common salt, and
   f. 0.3 to 0.7 parts by weight of lecithin
2. milling the mixture to form a paste,
3. passing the paste through a roll refining zone to form a thin sheet,
4. breaking up the sheet and mixing it with hydrogenated vegetable oil in amount sufficient to bring the total hydrogenated vegetable oil content of the mixture to a level in the range 20 to 32 parts by weight,
5. heating and agitating the resultant mixture,
6. raising the temperature of the mixture to pasteurization temperature and agitating it at such temperature for about 15 minutes, and then
7. extruding small globs of the mixture and cooling them to ambient temperature.

3,959,517

METHOD OF PREPARING FISH MEAT POWDER HAVING KAMABOKO-FORMING PROPERTY

Hiroshi Niki; Eiki Deya; Toru Doi, all of Sapporo; Seiichiro Igarashi, Tokorozawa; Kenkichi Ahiko, and Hiromichi Hayashi, both of Sapporo, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Sapporo, Japan

Filed Mar. 13, 1975, Ser. No. 557,995
Claims priority, application Japan, Aug. 9, 1974, 49-91272
Int. Cl.² A22C *25/00*
U.S. Cl. 426—643 11 Claims



1. A method for preparing an undenatured fish meat powder comprising:

mixing fish meat in an aqueous medium to form an aqueous slurry;

adding carbonic acid to said aqueous slurry; and

spray-drying said slurry to form the fish meat powder at a temperature sufficient to decompose said carbonic acid.

3,959,518

PROCESS FOR PRODUCING IMPROVED FISH MEAL, AND FISH OIL BY-PRODUCT

Daniel B. Vincent, P.O. Box 5478, Tampa, Fla. 33605

Continuation of Ser. No. 225,490, Feb. 11, 1972, abandoned. This application May 23, 1973, Ser. No. 363,145
Int. Cl.² A23L *1/325*
U.S. Cl. 426—643 4 Claims

1. A process for producing improved fish meal from fish, comprising:

A. cooking the fish;

B. expressing a first press liquor from the cooked fish, leaving a first press cake containing a higher percentage of solids and a lower percentage of moisture than the cooked fish had;

C. concentrating the first press liquor to about 30–50 percent solids, by weight, by evaporating moisture therefrom below a temperature of 185°F;

D. mixing the concentrated first press liquor with the first press cake to produce a mixture substantially richer in soluble solids than the fish entering step (A);

E. establishing a moisture balance within the mixture by providing a time delay of about three minutes between steps (D) and (F);

F. expressing a second press liquor from the mixture, leaving a second press cake containing a total amount of solids substantially equal to the total amount of solids in the fish entering step (A);

G. recycling the second press liquor for comingling with and concentration with the first press liquor; and

H. drying the press cake.

3,959,519

FORTIFICATION OF FOOD MATERIALS WITH A METHIONINE SOURCE

Rayner Selby Johnson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 251,656, May 9, 1972, abandoned. This application June 5, 1975, Ser. No. 584,121
Int. Cl.² A23K *1/16;* A23L *1/30*
U.S. Cl. 426—648 6 Claims

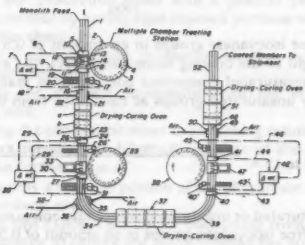
4. A stable fortified food material having incorporated therein a methionine source selected from at least one of glycyl-D,L-methionine, glycyl-L-methionine, D,L-methionylglycine, and L-methionylglycine.

3,959,520

CONTINUOUS SYSTEM FOR PROVIDING A CATALYTIC COATING ON SUPPORT MEMBERS

William A. Hoyer, Evanston; Lowell W. Johnson, Fox Lake, and Richard J. Schoenenberger, Kildeer, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Oct. 21, 1974, Ser. No. 516,519
Int. Cl.² B01J *37/02*
U.S. Cl. 427—8 7 Claims



1. A processing system which can provide for a continuous assembly-line procedure in effecting the placement of a catalytic coating on ceramic honeycomb type members with longitudinal passageways therethrough, which comprises the steps of:

a. sequentially feeding said members into a pressure tight, confined chamber and supporting said members therein to preclude blockage of said longitudinal passageways;

b. evacuating said chamber to effect a vacuum in the pores of said ceramic members;

c. subsequently filling said chamber with a slurry containing refractory inorganic oxide coating material and feeding the slurry into said passageways to coat and fill the pores of each of said members;

d. draining slurry from said confined chamber and then subsequently blowing pressurized air therethrough to remove excess slurry from said chamber and from the surfaces of said members;

e. sequentially effecting the removal of the thusly coated members from said chamber;

f. sequentially passing the resulting inorganic oxide coated members to a drying and heat treating zone to effect the high temperature curing thereof;

g. subsequently cooling the resulting oxide coated members and then again sequentially placing said members in a pressure tight confined chamber, whereby said members are subjected to the sequential steps of vacuum treating, coating and impregnating with a solution containing a catalytically active component and blowing with air to remove excess solution, all in a manner similar to steps (a) through (d);

h. effecting the removal of the resulting activated members;

i. passing the resulting impregnated members to a drying and curing zone to effect a high temperature treatment thereof; and

j. subsequently withdrawing the finished catalytically coated members.

3,959,521

PROCESS FOR THE FORMATION OF CURED COATINGS

Masao Suetsugi, Tokyo; Kozo Sato; Juichi Kobayashi, both of Ohtake, and Hideo Nakamoto, Yamaguchi, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 319,826, Dec. 29, 1972, abandoned. This application Dec. 6, 1974, Ser. No. 530,473

Int. Cl.² B44D 1/50

U.S. Cl. 427—44 **5 Claims**

1. A process for the formation of a composite cured coating which comprises:

1. applying to a base material a coating composition (A) comprising one member selected from the group consisting of (a) an unsaturated isocyanate compound containing both as many ethylenically unsaturated groups as calculated from the formula

$$0.5 \text{ to } 12 \times \frac{\text{Molecular Weight of Unsaturated Isocyanate Compound}}{1000}$$

and free isocyanate groups in an amount of 0.5 to 30% by weight of the coating composition (A), (b) a mixture of an unsaturated compound containing as many ethylenically unsaturated groups as calculated from the formula

$$0.5 \text{ to } 12 \times \frac{\text{Molecular Weight of Unsaturated Compound}}{1000}$$

and saturated or unsaturated isocyanate compound containing free isocyanate groups in an amount of 0.5 to 30% by weight of the coating composition (A), and (c) a mixture of the material (a) or (b) and a resinous saturated compound, to form an undercoat layer of the composition (A) on the base material,

2. thereafter applying to the thus-formed undercoat layer a resinous coating composition (B) comprising an unsaturated resin containing as many ethylenically unsaturated groups as calculated from the formula

$$0.5 \text{ to } 12 \times \frac{\text{Molecular Weight of Unsaturated Resin}}{1000}$$

to form a topcoat layer on the undercoat layer, and

3. then subjecting the topcoat and undercoat layers to the irradiation of electron beam or light having a wavelength of 2000 to 8000 A to thereby form the integrated, cured coating on the base material.

3,959,522

METHOD FOR FORMING AN OHMIC CONTACT

Ivan Ladany, Stockton, and Donald Paul Marinelli, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,387

Int. Cl.² B05D 5/12

U.S. Cl. 427—89 **6 Claims**

1. A method for forming an ohmic contact to N-type semiconductor material selected from the group consisting of gallium arsenide, aluminum gallium arsenide, gallium phosphide, and aluminum gallium phosphide, said method comprising the steps of:

depositing a thin layer of gold onto heated semiconductor material;

cooling the semiconductor material;

depositing a layer of tin onto the gold layer; and

reheating the semiconductor material until the tin alloys into and through the gold into the semiconductor material.

3,959,523

ADDITIVE PRINTED CIRCUIT BOARDS AND METHOD OF MANUFACTURE

John J. Grunwald, Waterbury; Peter E. Kukanskis, Naugatuck; Elaine F. Jacovich, Cheshire, and Eugene D. D'Ottavio, Waterbury, all of Conn., assignors to MacDermid Incorporated, Waterbury, Conn.

Filed Dec. 14, 1973, Ser. No. 424,896

Int. Cl.² C23C 3/02; B05D 5/12

U.S. Cl. 427—98 **6 Claims**

1. A method for producing printed circuit boards by an all-additive electroless plating procedure which eliminates the need for interrupting the plating operations to perform an adhesion-promoting baking step heretofore required to develop adequate adhesion, which comprises immersing a suitably-masked, catalyzed-surface substrate selected from the group consisting of paper or glass fiber reinforced phenolic, epoxy and polyester resins in a first electroless metal plating bath to produce thereon a first layer of said metal on the unmasked areas of said substrate, moving said substrate from said first bath through a water rinse immediately into at least one other electroless metal plating bath, to produce a metal composite of at least two layers of electroless metal on the unmasked portions of the substrate, wherein the thickness of the metal in the second layer always substantially exceeds that of the first layer, said metal plating baths each being selected from the group consisting of electroless nickel, cobalt and copper, and wherein, when copper is selected for the first electroless metal plating bath, such bath is adjusted to give a maximum deposition rate under ambient room temperature conditions of from around 0.03 to less than 0.10 mil per hour and wherein, when cobalt or nickel is selected for the first electroless metal plating bath, such bath is adjusted to give a maximum deposition rate of from around 0.02 to 0.3 mil per hour, the thickness of the deposit in either event being from about 0.005 to 0.2 mil.

3,959,524

METAL HALIDE DISCHARGE LAMP HAVING HEAT REFLECTIVE COATING

William M. Keeffe, Rockport, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Division of Ser. No. 454,390, March 25, 1974, Pat. No. 3,889,142. This application Nov. 22, 1974, Ser. No. 526,182

Int. Cl.² B05D 5/12

U.S. Cl. 427—106 **1 Claim**

1. The method of forming a heat reflective coating on the end of a metal halide discharge arc tube made of high silica glass comprising the steps of applying a coating on said end of a suspension including ZrO_2 and ZrB_2, the ratio of ZrO_2 to ZrB_2 in the suspension being between about 30:1 and 250:1,

drying said coating and firing said coating at a temperature of about 550° to 800°C.

3,959,525

METHOD OF COATING PHOTOFLASH LAMP

Thomas J. Sentementes, Wakefield; Eugene A. Castello, North Reading, and Richard Coppola, Beverly, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed June 24, 1974, Ser. No. 482,038
Int. Cl.² B05D 1/24, 3/02
U.S. Cl. 427—185 9 Claims

1. A method of coating the glass envelope of a photoflash lamp with a polymeric material wherein said lamp includes a quantity of combustible material located inside the envelope, ignition means attached to said envelope and having an exterior metallic portion extending from the glass envelope, said method comprising:

heating the glass envelope of said lamp at a first predetermined temperature above the melting point of the polymeric material for approximately 1 minute,

immersing said heated glass envelope in a fluidized bed of a powder of said polymeric material for less than about five seconds, said lamp being held during said heating and immersing steps by heat sink means gripping said exterior metallic portion of the ignition means, and

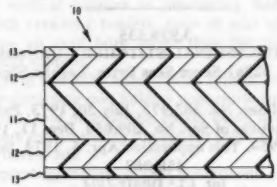
removing the coated lamp from said fluidized bed.

3,959,526

PROCESS FOR PREPARING HIGH BARRIER, HEAT-SEALABLE PACKAGING FILM

Isadore Swerlick, Richmond, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 20, 1974, Ser. No. 535,141
Int. Cl.² B05D 1/38; B32B 27/30
U.S. Cl. 427—209 9 Claims



1. In a process for coating a flexible packaging film with a sub-coating of a high barrier vinylidene chloride copolymer and a top coating of a heat sealable vinylidene chloride copolymer, said coatings being dried after applications,

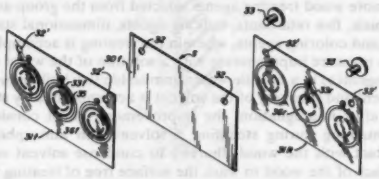
the improvement which consists in applying both coatings from a solvent solution of said copolymers, said top coating applied from a solution containing about 5 to 10% solids to a solids coating weight of about 0.5 to 3 grams/square meter, and drying said coated film to a level of retained solvents in both coating layers of less than about 500 ppm for each constituent of said solvent solution.

3,959,527

FLAT COSTUME JEWELRY AND METHOD FOR THE SURFACE TREATMENT THEREOF

Lee John Droege, 11 Karlann Drive, Rte. 4, Golden, Colo. 80401

Filed Apr. 8, 1974, Ser. No. 458,541
Int. Cl.² B44D 1/52
U.S. Cl. 427—259 10 Claims



1. In the process for the manufacture of a pendant or the like formed as a thin sheet metal body wherein the body is produced from a production sheet of thin metal by the steps of:

coating the production sheet with a positive photoresist characterized by having light exposed portions removable from the sheet;

exposing a portion of the production sheet to outline the pendant thereon;

removing the exposed photoresist from the production sheet; and

subjecting the production sheet to an etching solution to cut through the sheet and form the outline of the pendant, and the further steps of:

exposing only a selected portion of the photoresist covering the pendant; and

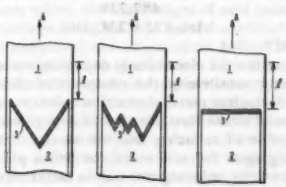
removing this exposed portion of photoresist from the pendant surface to expose the metal forming the body of the pendant at this selected portion with photoresist remaining at other portions on the pendant.

3,959,528

COATING METHOD

Hideo Takeda, and Nobuhiko Oyama, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 19, 1974, Ser. No. 534,392
Claims priority, application Japan, Dec. 19, 1973, 48-143289
Int. Cl.² B44D 5/02
U.S. Cl. 427—290 3 Claims



1. In a method of coating a liquid composition onto a smooth surface of a travelling, continuous web comprising the step of applying a liquid coating composition to said smooth surface of said web, the improvement which comprises the step of pre-roughening the surface area only of the web where the coating is started prior to applying said liquid coating.

3,959,529

WOOD TREATING PROCESS

William D. Winn, and Johnney T. Pollan, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 14, 1974, Ser. No. 479,239
Int. Cl.² B27K *3/08, 3/40*
U.S. Cl. 427—335 2 Claims

1. In a method for treating wood by impregnation with one or more wood treating agents selected from the group antimicrobials, fire retardants, bulking agents, dimensional stabilizers, and coloring agents, wherein the treating is accomplished by a pressure impregnation with a solution of the wood treating agent(s) in a volatile water-immiscible low boiling organic solvent and recovery of the solvent is accomplished by steaming after impregnation, the improvement which consists of maintaining during steaming a solvent rich atmosphere in contact with the wood, thereby to condense solvent on the surface of the wood to wash the surface free of treating agent and wood exudates.

3,959,530

CLEANING AND PROTECTIVE COATING COMPOSITION AND METHOD

Nicolas Kaliardos, 10725 Morang Ave., Detroit, Mich. 48224

Continuation-in-part of Ser. No. 319,851, Dec. 29, 1972, abandoned. This application Sept. 20, 1974, Ser. No. 507,851
Int. Cl.² B05D *3/10*; C09G *1/08*
U.S. Cl. 427—341 6 Claims

1. A cleaning and protective coating composition consisting essentially of a mixture of wax residue such as paraffin and microcrystalline wax, perchlorethylene, petroleum distillate having a boiling point ranging between 350° and 380°F., and a nonionic surfactant such as nonylphenoxypoly(ethyleneoxy)ethanol and a small amount of [N,N,N′,N′-tetrakis(2-hydroxypropyl)ethylenediamine].

3,959,531

ELECTROLESS METAL PLATING

Frederick W. Schneble, Jr., Oyster Bay; John F. McCormack, Roslyn Heights, and Rudolph J. Zeblisky, Hauppauge, all of N.Y., assignors to Photocircuits Corporation, Glen Cove, N.Y.

Continuation of Ser. No. 137,024, April 23, 1971, abandoned, which is a continuation of Ser. No. 867,974, Oct. 20, 1969, abandoned, which is a continuation of Ser. No. 523,897, Feb. 1, 1966, abandoned. This application July 11, 1974, Ser. No. 487,739
Int. Cl.² C23C *3/02*
U.S. Cl. 427—345 6 Claims

1. In a method for electrolessly depositing metal by contacting a surface sensitive to the reception of electroless metal with an electroless metal deposition solution comprising an ion of a metal whose electroless metal deposition is desired, an agent capable of reducing said ion to the metallic state, a complexing agent for said metal ion and a pH adjustor, the improvement for reducing extraneous metal deposition of the metal to be deposited which comprises removing from the components which will make up said solution iron ions until the aggregate content of said iron ions in said components is not more than 25 parts per million and thereafter maintaining the content of said iron ions in said solution at an aggregate content of not more than 25 parts per million by replenishing the components depleted from said solution during electroless metal deposition with components from which iron ions have been removed.

3,959,532

CARBON IMPREGNATION OF BURNED MAGNESITE BRICKS

Gunter Zoglmeyr, Radenthein, Austria, assignor to Osterreichisch-Amerikanische Magnesit Aktiengesellschaft, Austria

Filed July 10, 1974, Ser. No. 487,028
Claims priority, application Austria, July 12, 1973, 6165
Int. Cl.² C04B *35/52*
U.S. Cl. 427—372 7 Claims

1. An improved process for impregnating burned magnesite bricks with a carbonaceous material comprising impregnating the burned brick with an aqueous dispersion of carbon black and drying the impregnated brick with hot dry air having a temperature of at least 100°C.

3,959,533

METHOD OF IMPROVING ADHESION OF RUBBERY COPOLYMERS TO GLASS

Walter Kitaj, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 25, 1975, Ser. No. 561,926
Int. Cl.² B05D *17/10, 25/04*
U.S. Cl. 427—386 6 Claims

1. A method of improving the adhesion of a rubbery copolymer to a glass surface which comprises first applying a combination of from 90 to 95% by weight of a first primer consisting of a 50% by weight latex containing 55 mol percent styrene and 45 mol percent butadiene plus 2% by weight of N-aminoethyl-gamma-aminopropyltrimethoxysilane and from 10 to 5% by weight of a second primer consisting of 8.4 parts by weight of an epichlorohydrin-bisphenol A resin, 1.6 parts by weight of N-aminoethyl-gamma-aminopropyltrimethoxysilane and 45 parts by weight each of ethyleneglycolmonomethylether and ethyleneglycolmonoethylether acetate, subsequently coating the primed glass surface with said copolymer and curing said coating.

3,959,534

PROCESS FOR PRODUCING FIBERS

Kisoon Park, Charleston; Ronald L. Readshaw, South Charleston, both of W. Va., and George H. Lourigan, Chester, S.C., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 23, 1973, Ser. No. 353,503
Int. Cl.² C10M *1/18*; D06M *15/26*
U.S. Cl. 427—390 3 Claims

1. In a method for manufacturing or processing synthetic textile fibers comprising applying an effective amount of lubricants to the surface of said fibers, the improvement consisting of using aqueous dispersions of ethylene/acrylic acid or ethylene/methacrylic acid copolymers as the lubricants.

3,959,535

THREE-DIMENSIONAL STITCHERY ORNAMENTS

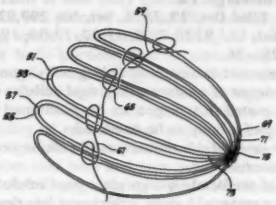
Alice Stewart, 32761 Seven Seas Drive, Laguna Niguel, Calif. 92677

Division of Ser. No. 383,973, July 30, 1973, Pat. No. 3,833,977, Division of Ser. No. 209,058, Dec. 11, 1971, Pat. No. 3,781,954. This application Apr. 5, 1974, Ser. No. 458,063
Int. Cl.² D04D *7/04*
U.S. Cl. 428—5 3 Claims

1. A three-dimensional ornament comprising:

a plurality of sets of multiple loops of stitchery material circularly disposed in a substantially cylindrical shape, each of said plurality of sets having its center contained on the surface of said substantially cylindrical shape and each of said plurality of sets being contiguous to respective adjacent sets of multiple loops, a portion of each of said plurality of sets being sewn to a contiguous portion of each respective adjacent set, thereby successively securing said plurality of sets of multiple loops together to maintain said cylindrical shape, the ends of said plural-

ity of sets of multiple loops adjacent one end of said cylindrical shape being linked with sewing material alternately passing through each set of multiple loops in succession, said sewing material being drawn up tight to link said ends of said plurality of sets of multiple loops to form a base for the ornament.

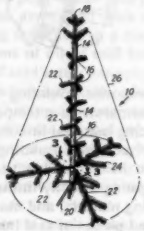


3,959,536

KNOCK-DOWN ARTIFICIAL CHRISTMAS TREE

Ascher Chase, Virginia Beach, Va., assignor to General Foam Plastics Corporation, Norfolk, Va.

Filed Nov. 27, 1974, Ser. No. 527,696
Int. Cl.[2] A47G *33/06*; A41G *1/00*
U.S. Cl. 428—8 7 Claims



1. An artificial tree assembly having a base support, and a tubular vertical support disposed upon said base support; said assembly comprising

a. a plurality of branch retaining holders, each of said holders having axial bores for receiving said vertical support, the diameter of said bores being larger than the diameter of said vertical support;

b. a plurality of cylindrical spacer elements disposed along said vertical support in alternating fashion with said branch retaining holders, each of said spacer elements having an axial bore larger than the diameter of said vertical support;

c. means in said axial bores of said branch retaining holders for maintaining said holders concentric with said vertical support, said maintaining means being integral with said holders and extending toward but spaced from the axes of said bores; and

d. cooperating means on said holders and said spacer elements for maintaining said spacer elements concentric with said vertical support.

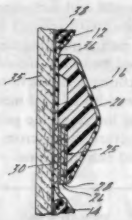
3,959,537

DIELECTRICALLY BONDABLE DECORATIVE STRIPS

Theodore Loew, Schenectady, N.Y., assignor to The Standard Products Company, Cleveland, Ohio

Filed Mar. 6, 1974, Ser. No. 448,488
Int. Cl.[2] B60R *13/00*
U.S. Cl. 428—31 4 Claims

1. In an elongated trim strip having a body adapted to overlie the linear juncture defined by abutting edges of two dissimilar substrate surfaces, said body being formed of a material which is not thermally bondable to both such substrate surfaces, means for securing the body to both of such substrate surfaces and in overlapping relationship thereto, comprising two dissimilar bottom surface portions rigidly carried by said body and extending longitudinally thereof, said bottom surface portions being formed of different thermally bondable thermoplastic materials, one of such materials being compatible with and thermally bondable to one of the dissimilar substrate surfaces and the other of said materials being thermally bondable to the other of said substrate surfaces.

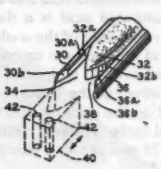


3,959,538

DECORATIVE PLASTIC TRIM

Theodore Loew, Schenectady, N.Y., assignor to The Standard Products Company, Cleveland, Ohio

Division of Ser. No. 213,435, Dec. 29, 1971, abandoned. This application Mar. 21, 1975, Ser. No. 560,782
Int. Cl.[2] B32B *1/04*, *31/00*; E04F *19/02*; B60J *9/00*
U.S. Cl. 428—31 6 Claims



1. A decorative plastic trim strip mountable on an underlying surface comprising, an elongated extrusion of synthetic plastic having a longitudinally extending intermediate portion and side portions integral therewith and extending longitudinally along the opposite sides of said intermediate portion, said intermediate portion and said side portions in cross-section having a common bottom surface and corresponding outer surfaces spaced above said bottom surface, the outer surfaces of said side portions having laterally spaced apart inner and outer edges, the inner edges of said outer surfaces of said side portions being laterally spaced apart and intersecting the outer surface of said intermediate portion at an angle to provide laterally spaced apart visible lines in juncture between said intermediate and side portions, the cross-sectional contours of said side portions being identical, said intermediate portion having an end including a planar end face perpendicular to said common bottom surface and intersecting said bottom surface and the outer surface of said intermediate portion, said end face of said intermediate portion extending laterally from a first point on the line of juncture between one of said side portions and said intermediate portion to a second point on the line of juncture between the other of said side portions and said intermediate portion, at least one of said side portions extending continuously and uninterruptedly about the corresponding one of said first and second points and laterally along said end face of said intermediate portion, said one side portion having a planar inner surface extending perpendicular from said common bottom surface and intersecting

the corresponding one of said lines of juncture, said inner surface being in juxtaposed facially engaging relationship with said end face of said intermediate portion, said one side portion further having a terminal end including an end face spaced from said corresponding point in the direction toward the other of said first and second points, the other of said side portions having a terminal end including an end face in juxtaposed facial engagement with respect to the end face of said one side portion, and means bonding said inner surface of said one side portion to said end face of said intermediate portion whereby said side portions define a border extending longitudinally along opposite sides of said intermediate portion and around said end of the intermediate portion, said border having just one line of juncture thereacross defined by said juxtaposed end faces of said side portions.

3,959,539

COATING MATERIAL OF POLYMERS AND SALTS OF FATTY ACIDS

Marion Glen Waggoner, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 419,891, Nov. 28, 1973, abandoned. This application Nov. 13, 1974, Ser. No. 523,477

Int. Cl.² C08L *91/00*

U.S. Cl. 428—35 **21 Claims**

1. Powder coating material for glass which consists essentially of a copolymer of α-olefins of the formula $R—CH=CH_2$, where R is a radical selected from the class consisting of hydrogen and alkyl radicals having from 1 to 8 carbon atoms, and α,β-ethylenically unsaturated carboxylic acids having from 3 to 8 carbon atoms, said copolymer having from 0% to 90% of the carboxylic acid groups ionized by neutralization with uncomplexed metal ions, said metal ions having an ionized valence of from one to three inclusive when the unsaturated acid is a monocarboxylic acid and an ionized valence of one when the unsaturated acid is a dicarboxylic acid said copolymer being a copolymer of the α-olefins and the unsaturated carboxylic acid in which the carboxylic acid groups are randomly distributed over all molecules and in which

1 the α-olefin content of the copolymer is at least 50 mol percent, based on the α-olefin-acid copolymer,

2 the unsaturated carboxylic acid content of the copolymer is from 0.2 to 25 mol percent, based on the α-olefin-acid copolymer, and

3 any other monomer component optionally copolymerized in said copolymer is monoethylenically unsaturated,

and 1 to 20% by weight, based on the weight of the copolymer, of an additive selected from the class consisting of monobasic fatty acids of 10 to 22 carbon atoms, metal salts of monobasic fatty acids of 10 to 22 carbon atoms, and mixtures thereof.

3,959,540

GASTRIC JUICE RESISTANT GELATIN CAPSULES AND A PROCESS FOR THE PRODUCTION THEREOF

Richard Leiberich, Eberbach, and Wilfried Gabler, Heidelberg, both of Germany, assignors to R.P. Scherer GmbH, Eberbach, Baden, Germany

Filed Aug. 8, 1974, Ser. No. 495,896

Claims priority, application Germany, Aug. 8, 1973, 2340060

Int. Cl.² A61K *9/58*

U.S. Cl. 428—35 **7 Claims**

1. A gastric juice resistant gelatin capsule comprising a gelatin shell, a gastric juice resistant outer coating comprising an anionic polymerizate of methacrylic acid and acrylic acid esters, and an intermediate layer between said outer coating and the gelatin shell comprising a cationic polymerizate of di-lower alkylamino lower alkylmethacrylate with other neutral methacrylic esters, wherein lower alkyl is of 1 to 4 carbon atoms.

3,959,541

COMPOSITE LAMINATE INSULATING BODY

Walter C. King, Pittsburgh, and Richard J. Medvid, Natrona Heights, both of Pa., assignors to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Filed Dec. 20, 1971, Ser. No. 209,920

Int. Cl.² B32B *7/00, 15/00, 17/00, 19/00*

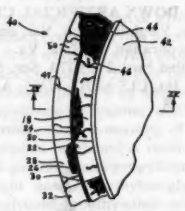
U.S. Cl. 428—36 **12 Claims**

1. A composite laminate insulating body comprising,

an inner layer of a substantially rigid cellular ceramic insulating material arranged to be positioned adjacent the surface of a body to be insulated,

an outer layer of substantially rigid cellular ceramic insulating material, and

a layer of uniformly woven glass fiber insulating and reinforcing material having a thickness less than ¼ inch and a thread count of between about 20 and 10 warp and between about 20 and 10 fill, said layer of said uniformly woven glass fiber disposed between said inner and outer layers of cellular insulating material, said layers being adhesively secured to one another by use of a bonding



agent and said composite insulating body characterized by resistance of thermal stress at temperatures to 1000°F, said layer of reinforcing material limiting cracks formed in said inner layer of cellular insulating material adjacent said surface to be insulated due to excessive thermal stress from propagating directly through said outer layer of cellular insulating material and maintaining the integrity of the fractured pieces of said inner layer of cellular insulating material with said surface to be insulated.

3,959,542

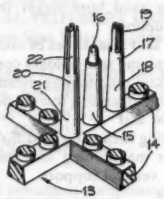
ARTIFICIAL SKI MATTING

Paul A. Livermore, 964 N. Larrabee - No. 101-A, Los Angeles, Calif. 90069

Filed July 12, 1974, Ser. No. 487,915

Int. Cl.² B32B *3/10*

U.S. Cl. 428—44 **2 Claims**



1. An artificial ski mating comprising:

a plurality of interconnected artificial ski mats, each of said mats including a relatively rigid base formed of resilient interconnected and intersecting ribs, a first plurality of spaced resilient base pegs extending vertically upwardly from said ribs, each of said base pegs being substantially the same height and terminating in a rounded upper surface forming a generally horizontal ski support sur-

face, a second plurality of spaced resilient turn pegs extending generally vertically upward from said ribs and integral therewith, each of said second plurality of turn pegs having a generally frustoconically shaped main body portion, each of said body portions terminating at their upper ends in a plurality of generally vertically upwardly extending spaced elongated turn fingers more flexible than said body portions and of subtantially the same overall length forming a generally horizontal ski turn surface vertically spaced from said ski support surface; said turn pegs being spaced from said base pegs; and a hird plurality of resilient fluff pegs extending generally vertically upwardly from said ribs and integral therewith spaced from said base and turn pegs, each of said third plurality of fluff pegs having a generally frustoconically shaped main body portion, each of said last-mentioned main body portions terminating at their upper ends in a plurality of generally vertically upwardly extending spaced elongated flexible fluff fingers of substantially the same overall length and of an overall height greater than the overall height of the flexible fingers of said second plurality of pegs and more flexible than said last-mentioned main body portion, the uppermost ends thereof forming a generally horizontal ski fluff surface vertically spaced from said horizontal ski turn surface, each of said fluff fingers being more flexible than each of said turn fingers;

each of said base pegs being disposed between one of said turn pegs and one of said fluff pegs, at least a plurality of said pegs being disposed on each of said mats in a 1:1:1 ratio of said base pegs to said turn pegs to said fluff pegs;

connecting means associated with each of said mats for interconnecting said mats in a manner whereby the uppermost portions of all of said bases and fluff and turn fingers of all of said interconnected mats lie generally in the same respective horizontal plane; and

each of said mats having approximately a four-sided configuration, at least some of said sides being non-linear in configuration and a mirror image of its opposite sides, said connecting means including downwardly extending connecting pegs on one of said sides and connecting peg receiving holes on the opposite sides receiving said connecting pegs therein, each of said mats being undercut in the vicinity of said connecting pegs and oppositely undercut in the vicinity of said connecting peg receiving holes so that the uppermost portions of all of said bases and said turn and fluff fingers of all of said interconnected mats lie generally in the same respectively horizontal plane, the connecting pegs extending through said connecting holes and including upset rivet heads at their terminal ends of a width greater than the diameter of said holes thereby fixedly securing said connecting pegs in said connecting holes, thereby rigidly securing one of said mats to the other forming a welded unitary matting, and the undersurface of the ribs of each interconnected mat having support means thereon cooperating with said heads for providing a resilient upwardly and downwardly movable cushioning surface adapted to simulate the compaction of natural snow that is made by a ski passing thereover as a ski passes over said matting.

3,959,543

NON-LINEAR RESISTANCE SURGE ARRESTER DISC COLLAR AND GLASS COMPOSITION THEREOF

Howard F. Ellis, Stephentown, N.Y., assignor to General Electric Company

Division of Ser. No. 361,250, May 17, 1973. This application May 6, 1974, Ser. No. 467,442

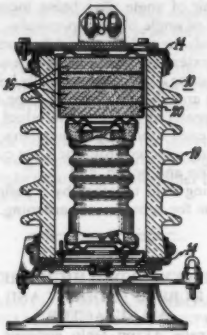
Int. Cl.² B32B *3/02, 15/00*

U.S. Cl. 428—66 **2 Claims**

1. A non-linear resistance device of the type having a resistance element of predominantly zinc oxide and an insulating coating on a portion of the surface of said element, wherein the improvement comprises that said coating is a glass consisting essentially of:

from about 41% to about 48% by weight of lead oxide,

from about 22.5% to about 26.5% by weight of zinc oxide,



from about 18.5% to about 22.5% by weight of boric oxide,

from about 2.5% to about 6.5% by weight of silicon oxide, and

from about 4.0% to about 8.0% cupric oxide.

3,959,544

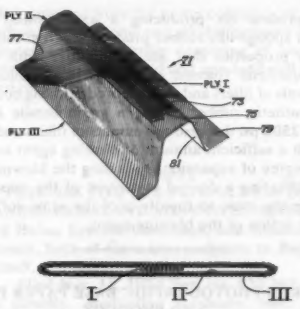
FILAMENTARY TAPE CONSTRUCTIONS AND METHODS

Charles W. Rogers, 112 W. Jessamine, Fort Worth, Tex. 76110

Filed Dec. 26, 1973, Ser. No. 427,455

Int. Cl.² B32B *5/12*

U.S. Cl. 428—109 **4 Claims**



1. A flexible plied filamentary tape of a given width for use for constructing a load bearing member, said tape being formed of fibers pre-aligned to carry the various loads within the load bearing member and comprising:

a first ply of unidirectional fibers extending along the length of said tape,

a first flattened tube-shaped member extending along the length of said tape and whose flattened sides define a first pair of angle plies in the plane of said tape and which are formed of fibers that extend transversely to each other respectively and oblique to the fibers of said first ply,

a second flattened tube-shaped member extending along the length of said tape and whose flattened sides define a second pair of angle plies in the plane of said tape and which are formed of fibers that extend transversely to each other respectively and oblique to the fibers of said first ply,

the width of said second tube-shaped member, as seen in a transverse cross-section of said tape, being slightly

greater than the width of said first flattened tube-shaped member and defining said given width of said tape,

said first flattened tube-shaped member being located within said second flattened tube-shaped member with said first pair of angle plies being located close to said second pair of angle plies respectively,

the fibers of adjacent plies of said first and second pair of angle plies extending transversely to each other,

said first ply having a width substantially less than the widths of said first and second flattened tube-shaped members and being centered between the edges of said first and second flattened tube-shaped members,

said fibers being selected from the class consisting of fiberglass, graphite and boron, and

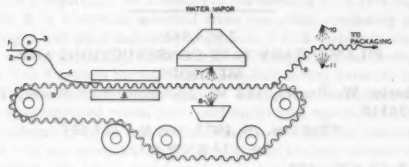
said fibers being held together by a resin in the uncured state suitable for subsequent hardening.

3,959,545

UNVULCANIZED EXPANDED HIGH GREEN STRENGTH SYNTHETIC RUBBER PRODUCT AND METHOD OF MANUFACTURE

Roy W. Siedenstrang, Akron, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 6, 1974, Ser. No. 440,168
Int. Cl.² B29D *7/14, 27/00*
U.S. Cl. 428—141 **22 Claims**



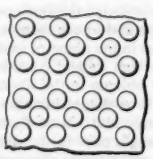
1. A process for producing a unvulcanized expanded foamed or sponge-like rubber product which at room temperature has properties that are competitive with vulcanized styrene-butadiene foamed or sponge-like products having similar levels of fillers and extenders comprising compounding into a synthetic rubber having a green tensile strength in excess of **2500** psi the desired amounts of fillers and extenders along with a sufficient amount of blowing agent to effect the desired degree of expansion, activating the blowing agent by heating, effecting a desired expansion of the mass and then quenching the mass to rapidly cool the same sufficiently to arrest the action of the blowing agent.

3,959,546

TEXTURED PHOTOGRAPHIC BASE PAPER PROCESS AND PRODUCT

John A. Hill, Pulaski, N.Y., assignor to Schoeller Technical Papers Company, Pulaski, N.Y.

Filed Apr. 15, 1974, Ser. No. 460,698
Int. Cl.² G03C *1/86;* **B05D** *5/00, 3/12*
U.S. Cl. 428—141 **10 Claims**



1. Process for the production of a polyolefin coated photographic base paper having a textured silk-like surface for coating with a light sensitive silver halide emulsion to form a photographic print paper comprising the steps of

a. applying a continuously extruded molten film of at least 1 mil of a polyolefin to a traveling photographic paper web at a point where the web enters a nip between a patterned chill roll and a rubber roll,

b. adhering said film to said paper web and simultaneously imparting a pattern of closely spaced raised portions having a height of **0.4** to **0.7** mils to the surface of said film by maintaining a pressure nip between said chill roll and said rubber roll, and,

c. cooling said formed film surface to a temperature at which said pattern is set, thereby replicating the pattern on the chill roll.

3,959,547

PROCESS FOR THE FORMATION OF REAL IMAGES AND PRODUCTS PRODUCED THEREBY

Joseph Polichette, South Farmingdale, and Edward J. Leech, Oyster Bay, both of N.Y., assignors to Photocircuits Division of Kollmorgen Corporation, Glen Cove, N.Y.

Division of Ser. No. 167,435, July 29, 1971, Pat. No. 3,772,078. This application Aug. 13, 1973, Ser. No. 387,587
The portion of the term of this patent subsequent to Nov. 13, 1990, has been disclaimed.
Int. Cl.² B32B *3/10*
U.S. Cl. 428—209 **21 Claims**

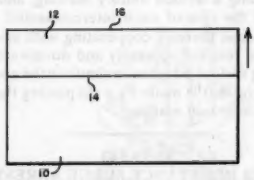
1. In a process for selectively metallizing insulating substrates with real images, the steps which comprise depositing on said substrate a layer of a reducible metal composition by treating the substrate with a solution comprising a reducible salt of a non-noble metal, thereafter drying said layer, and exposing said dried layer to contact with a solution of a chemical reducing agent for the metal in said salt for a period sufficient to darken said layer and to reduce said metal salt to metallic nuclei thereof and wherein at least one of said treating and exposng steps is restricted to a selected pattern on said substrate to produce a non-conducting real image of said metallic nuclei in said selected pattern and capable of directly catalyzing the deposition thereon of metal from an electroless metal bath.

3,959,548

GRADED COMPOSITION COATINGS FOR SURFACE PROTECTION OF HALIDE OPTICAL ELEMENTS

Enrique G. Bernal, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 16, 1974, Ser. No. 515,139
Int. Cl.² B32B *7/02;* **G02B** *1/00*
U.S. Cl. 428—212 **5 Claims**



1. An optical element comprising:

a body of essentially a first halide material, the first halide material having the undesirable property of being soluble in water;

a protective layer covering a surface of the body, the protective layer comprising an alloy of the first halide material and a second halide material which is essentially insoluble in water, the composition of the protective layer varying from essentially the first halide material at the

interface of the body and the protective layer to essentially the second halide material at an opposite surface of the protective layer;

wherein the second halide material has an absorption coefficient which is less than about 1,000 times the absorption coefficient of the first halide material in a wavelength region of interest; and

wherein the second halide material has a coefficient of thermal expansion which differs from the coefficient of thermal expansion of the first halide material by less than about 20 percent.

3,959,549
MULTI-LAYER INSULATION FOR DEEP-COOLED CABLES

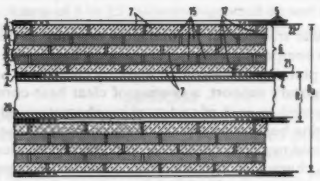
Peter Penczynski, Erlangen; Peter Jacobsen, Berlin; Günther Mätthaus, Spardorf, and Peter Massek, Forchheim, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 1, 1974, Ser. No. 493,899

Claims priority, application Germany, Aug. 8, 1973, 2340228

Int. Cl.² B32B *7/02*

U.S. Cl. 428—213 **4 Claims**



1. A multi-layer electrical insulation employing insulating foils having a dielectric loss factor smaller than 5×10^{-5} for use in deep-cooled cables such as superconducting three-phase cables in a coaxial conductor configuration, comprising:

a. a plurality of layers of insulating foil selected from the group consisting of high density polyethylene, polypropylene and polytetraflourethylene having a dielectric loss factor smaller than 55×10^{-5}; and

b. layers of spun bonded paper of high density polyethylene fibers between each two layers of said insulating foil.

3,959,550
FILMS PREPARED FROM PVC GRAFTED WITH ACRYLATE-NITRILE MIXTURES

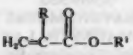
Mark S. Guillod, Menlo Park, Calif., and Richard G. Bauer, Kent, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed July 31, 1974, Ser. No. 493,356

Int. Cl.² C08L *27/02, 31/02, 33/20, 51/00*

U.S. Cl. 428—220 **6 Claims**

1. A flexible, tear resistant sheeting having a thickness of 0.001 to 0.250 inch and comprised of a grafted polymer prepared by subjecting a solution of a polyvinylchloride type polymer, an acrylic ester and an acrylic nitrile to polymerization conditions in the presence of an organic peroxide, wherein the polyvinylchloride type polymer is prepared from a monomer system comprising 80 to 100 parts by weight of vinyl chloride and 0 to 20 parts by weight of a copolymerizable monoolefinic monomer per 100 parts by weight of total monomer, wherein the acrylic ester has the following structural formula



wherein R is selected from the group consisting of hydrogen, methyl and ethyl, and wherein R^1 is an alkyl radical containing 1 to 20 carbon atoms, wherein the acrylic nitrile is selected from the group consisting of acrylonitrile, methacrylonitrile, and ethacrylonitrile, wherein the weight ratio of the polyvinylchloride type polymer to the combined ester plus nitrile monomer is from 1:1 to 9:1, wherein the concentration of the polyvinylchloride type polymer in the solvent is from 2.0 parts to 20 parts by weight per 100 parts by weight of solvent and wherein the weight ratio of ester monomer to nitrile monomer is from 0.4:1 to 9:1.

3,959,551
DIALKYL ALKYL AND AROMATIC SULFONAMIDOMETHYL PHOSPHONATES

Peter Golborn, Lewiston, and James J. Duffy, Buffalo, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Division of Ser. No. 239,757, March 30, 1972, Pat. No. 3,870,771. This application Dec. 31, 1974, Ser. No. 537,721

Int. Cl.² C07F *9/40*

U.S. Cl. 428—272 **56 Claims**

1. An article comprising a textile selected from the group consisting of cellulosic fibers, proteinaceous fibers and blends thereof and a flame retardant amount of a compound of the formula

wherein R is selected from the group consisting of lower alkyl of 1–6 carbon atoms, phenyl and alkyl substituted phenyl, and R′ is selected from the group consisting of phenyl, lower alkenyl and halogen substituted and unsubstituted lower alkyl of 1–6 carbon atoms.

3,959,552
PROCESS FOR THE PRODUCTION OF CLEANING-RESISTANT NONWOVEN MATERIALS

Ferdinand Heins, Erkrath-Unterbach, and Hellmut Striegler, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Nov. 11, 1974, Ser. No. 522,353

Claims priority, application Germany, Nov. 15, 1973, 2357068

Int. Cl.² B32B *27/04*; **C08F** *226/02*

U.S. Cl. 428—290 **3 Claims**

1. A process for the production of a nonwoven material of improved dry-cleaning resistance, in which a nonwoven material is treated with an aqueous dispersion of a copolymer consisting of copolymerised units of

A. 1.0 to 2.5% by weight of N-methylolacrylamide, N-methylolmethacrylamide, or a mixture thereof;

B. 1.0 to 5% by weight of acrylamide, methacrylamide, or a mixture thereof;

C. 0.5 to 3% by weight of at least one α,β-monoolefinically unsaturated dicarboxylic or tricarboxylic acid having 4 to 6 carbon atoms; and

D. 89.5 to 97.5% by weight of at least one acrylic or methacrylic acid ester having 1 to 18 carbon atoms in the alcohol component,

up to 50% by weight of component (D) being replaceable by at least one α,β-monoolefinically unsaturated monomer other than those mentioned in (A) to (C).

3,959,553

MAGNETIC DISCS HAVING METAL SUPPORT AND A NON-MAGNETIC LAYER

Job Werner Hartmann, Ludwigshafen; Werner Ostertag; Rudolf Sand, both of Willstaett; Dieter Schaefer, Ludwigshafen, and Hans Joerg Hartmann, Freinsheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 9, 1973, Ser. No. 414,331

Claims priority, application Germany, Nov. 10, 1972, 2255028

Int. Cl.² H01F *10/00*

U.S. Cl. 428—329 6 Claims

1. Magnetic discs manufactured by coating a non-magnetic metallic base disc with a dispersion of a finely divided magnetic pigment in a solution of a binder in an organic solvent and converting the coating into a solid hard magnetic coating of predetermined hardness by drying and curing and subsequently grinding and/or polishing the magnetic coating, wherein the non-magnetic metallic base disc has first been coated with a hard and polishable non-magnetic intermediate layer having a thickness of from 2 to 25 μ of a pulverulent mixture of finely divided inorganic non-magnetic pigments having a Mohs' hardness of at least 7, said mixture containing at least 3 percent by weight, based on the pigment mixture, of corundum powder having a particle size of from about 1 to 20 μ, dispersed in a curable binder, said intermediate layer containing about 50 to 75 percent by weight of the mixture of finely divided non-magnetic pigments, based on the sum of the amounts of pigment and binder which provides firm cohesion of the pigment particles and good adhesion thereof to the non-magnetic base disc.

3,959,554

AQUEOUS THERMOSETTING ACRYLIC ENAMEL FOR FINISHING FLEXIBLE HYDROCARBON RUBBER SUBSTRATES

Robert M. Hick, Springfield, Pa., assignor to E. I. du Pont de Nemours and Co., Wilmington, Del.

Division of Ser. No. 472,209, May 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 319,897, Dec. 29, 1972, Pat. No. 3,841,895. This application Mar. 10, 1975, Ser. No. 557,182

Int. Cl.² B32B *27/40*; C08L *61/26*

U.S. Cl. 428—336 5 Claims

1. A flexible rubber substrate finished with 0.1–10 mil thick finish of a cross-linked thermosetting acrylic enamel; wherein the film-forming constituents of the enamel comprise:

A. 70–95 percent by weight, based on the weight of the film-forming constituents, of an acrylic polymer consisting essentially of

1. 19–44 percent by weight, based on the weight of the acrylic polymer, of an alkyl methacrylate having one to four carbon atoms in the alkyl group or styrene, or a mixture thereof;
2. 50–75 percent by weight, based on the weight of the acrylic polymer, of an alkyl methacrylate having 6–12 carbon atoms in the alkyl group or an alkyl acrylate having 2–12 carbon atoms in the alkyl group or a mixture thereof;
3. 5–20 percent by weight, based on the weight of the acrylic polymer, of a hydroxy alkyl acrylate or a hydroxy alkyl methacrylate or a mixture thereof having two to four carbon atoms in the alkyl groups; and
4. 1 – 20 percent by weight, based on the weight of the acrylic polymer, of an α,β-ethylenically unsaturated carboxylic acid; and

B. 5 – 30 percent by weight, based on the weight of the film-forming constituents, of a compatible alkylated melamine formaldehyde having one to eight carbon atoms in the alkyl group;

wherein the flexible substrate comprises a surface activated thermoplastic polyurethane rubber.

3,959,555

HEAT-SEALABLE MARKING LABELS

Ian Harold Day, and John Carmichael-Drage, both of London, England, assignors to Polymark Corporation, Cincinnati, Ohio

Division of Ser. No. 71,056, Sept. 10, 1970, abandoned. This application Mar. 6, 1974, Ser. No. 449,419

Claims priority, application United Kingdom, Sept. 19, 1969, 46301/69

Int. Cl.² B32B *27/34*, *27/30*

U.S. Cl. 428—349 10 Claims

1. A heat transfer for permanently marking flexible textile products comprising a temporary support having release properties, a plurality of individual marking characters printed on said temporary support, a coating of clear heat-curable resin superimposed on each of said marking characters individually, said coating being substantially coextensive with the edges of each of said marking characters, the printing medium of said marking characters and the clear layer each comprising a theremoplastic cross-linking resin system capable of being cured by heat and pressure to form an inert and wear-resistant marking on the surface of the article to be marked and said printing medium including a pigment.

3,959,556

ANTIMICROBIAL BLENDED YARNS AND FABRICS COMPRISED OF NATURALLY OCCURRING FIBERS

Willard L. Morrison, 1896 Meadowbrook Drive, Winston-Salem, N.C. 27104

Continuation-in-part of Ser. No. 349,798, April 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 330,458, Feb. 7, 1973, abandoned, which is a division of Ser. No. 143,634, May 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 754,075, Sept. 20, 1968, abandoned. This application July 2, 1974, Ser. No. 485,207

Int. Cl.² B32B *27/00*; D02G *3/00*

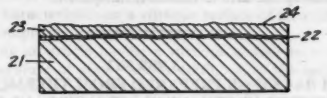
U.S. Cl. 428—364 2 Claims

1. Improved composite antimicrobial yarns comprising an intimate admixture of naturally occurring fibers and synthetic fibers, said synthetic fibers selected from the group of fiber forming polymers consisting of polyolefins, modacrylics, nylon 4, nylon 6, nylon 66 and having incorporated therein at least 0.1% by weight of the resin an antimicrobial agent selected from the group consisting of 2,4,4′-trichloro-2′-hydroxydiphenyl ether; 2,2′-methylenebis- (3,4,6-trichlorophenol); and 2,2′-thiobis (4,6-dichlorophenol), wherein said agent is mixed with said fiber forming polymer in the molten state, said synthetic fibers having a denier in the range of 1.5–60 dpf and being admixed with said naturally occurring fibers in a weight to weight ratio of from 35/65 to 65/35, said composite yarns being characterized by said antimicrobial agent migrating to the surface of said synthetic fibers and then transferring to the entire surface of said naturally occurring fibers to impart antibacterial properties thereto.

3,959,557
WEAR-RESISTANT, NONABRADING TIC ARTICLE AND PROCESS FOR MAKING

Alan R. Berry, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 4, 1974, Ser. No. 520,359
Int. Cl.² C23C 11/08; B32B 15/04
U.S. Cl. 428—368 13 Claims

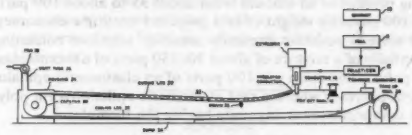


13. A laminated wear-resistant article comprising:
a plain carbon steel substrate having no more than 0.8 weight percent carbon and essentially free of carbide forming elements;
a thin, dense, continuous coating of titanium nitride having a thickness of about 1 to 5 microns deposited on and metallurgically bonded to said substrate; and
a thin, continuous, smooth titanium carbide coating, having a thickness of 5 to 25 microns deposited on and metallurgically bonded to said thin titanium nitride coating.

3,959,558
PRESSURELESS CURING SYSTEM FOR CHEMICALLY CROSS-LINKING ETHYLENE-CONTAINING POLYMERS AND PRODUCT FORMED THEREBY

Burton Thornley MacKenzie, Jr., Monroe, Conn., assignor to General Electric Company, New York, N.Y.

Continuation-in-part of Ser. No. 679,870, Nov. 1, 1967, abandoned. This application Dec. 18, 1970, Ser. No. 97,462
Int. Cl.² C08K 9/04
U.S. Cl. 428—379 15 Claims



1. A method of curing a composition comprising an ethylene containing polymer and mineral filler at substantially atmospheric pressure to a relatively dense and substantially non-porous cured polymeric composition, comprising the steps of: treating a mineral filler with an organic compound selected from the group consisting of maleic anhydride, dimethyl itaconate, and acrylic acid, by admixing said mineral filler with about 0.15 to 4.0 per cent of said organic compound by weight of the filler, and preparing the composition by admixing ingredients of the composition comprising an ethylene containing polymer, said mineral filler and treating organic compound, and curing agent; and thereafter heating the said admixed composition at about atmospheric pressure in a non-aqueous heat transfer medium to a temperature and for a dwell time sufficient to effect an in situ cross-linking cure of the ethylene containing polymer to a relatively dense and substantially non-porous cured filled polymer composition.

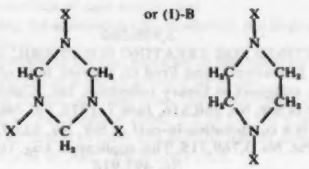
3,959,559
PROCESS FOR PRODUCING MODIFIED SYNTHETIC FIBERS

Masakazu Kimoto, and Isoo Shimonishi, both of Takatsukishi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

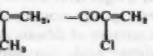
Filed June 11, 1974, Ser. No. 478,366
Claims priority, application Japan, June 29, 1973, 48-72836
Int. Cl.² D06M 13/30, 13/54
U.S. Cl. 428—394 12 Claims

1. A process for producing modified synthetic fibers having antistatic, hydrophylic and anti-fouling properties which comprises adhering onto the surface of synthetic fibers, 0.2–8% by weight based on the weight of the fibers of a reaction product of either one of a s-triazine derivative or a piperazine derivative of the general formula

(I)-A or (I)-B



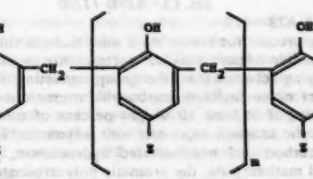
wherein, X is $-CH_2CH{=}CH_2$, $-COCH{=}CH_2$,



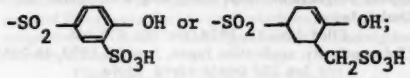
or $-COCH_2CH_2Cl$, with a compound of the general formula

(II)

wherein X′ is $-NH_2$, $-NHCH_3$, $-SO_3NH_2$, $-SO_3CH_2CH_2NH_2$ or $-COCH_2NH_2$; R is oxyethylene; and n is an integer at which the molecular weight of the compound of the general formula (II) falls within the range of 200 – 5,000, and thereafter adhering onto the surface of the resulting fibers, 0.05 – 3% by weight based on the weight of the fibers of an aromatic sulfonic acid of the general formula (III)



wherein Y is —H, —CH_2OH or —CH_2SO_3H; Z is —SO_3H, —CH_2SO_3H,



and *m* is an integer of 5–20.

3,959,560

METHOD FOR TREATING POLYMERIC FIBERS

Robert J. Sturwold, and Fred O. Barrett, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Division of Ser. No. 260,516, June 7, 1972, Pat. No. 3,850,682, which is a continuation-in-part of Ser. No. 223,752, Feb. 4, 1972, Pat. No. 3,769,215. This application Aug. 16, 1974, Ser. No. 497,918

The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.

Int. Cl.² C08J 7/06

U.S. Cl. 428—394 **9 Claims**

1. The method for lubricating and improving antistatic properties of polymeric materials which comprises treating a polymeric fiber selected from the group consisting of polyolefins, polyamides, polyacrylonitriles and polyesters with an ester obtained by reacting about 1.5 to 2.1 mols polyoxyalkylene glycols having a molecular weight from about 300 to 4000 wherein the recurring alkylene groups contain from 2 to 4 carbon atoms with 1 mol of a mixture of dibasic acids consisting of 5 to 95 mol percent dimer acids containing 32 to 54 carbon atoms and 95 to 5 mol percent short-chain dibasic acids containing 2 to 12 carbon atoms, so that about 70% or more of the carboxyl groups are reacted.

3,959,561

TRANSPARENT ASTATIC RESINOUS ARTICLES AND METHOD FOR THEIR PRODUCTION

Wilhelm E. Walles, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 773,969, Nov. 6, 1968, which is a continuation-in-part of Ser. No. 686,715, Nov. 29, 1967, abandoned. This application June 28, 1971, Ser. No. 157,604

Int. Cl.² B29D 11/00

U.S. Cl. 428—412 **9 Claims**

1. A process for rendering a solid transparent article of a sulfonatable organic polymer permanently astatic, said polymer being selected from the group consisting of homopolymers of monovinylidene carbocylic aromatic monomer, copolymers of at least 10 weight percent of monovinylidene carbocylic aromatic monomer with polymerizable substituted hydrocarbon and unsubstituted hydrocarbon; polymers of methyl methacrylate, the aromatic polycarbonates, polymers of 4-methylpentene-1, polyesters, rubber hydrochlorides, and polyimides, which process comprises (a) contacting the surface of said article with gaseous sulfur trioxide in an inert gaseous diluent, the concentration of sulfur trioxide in the inert diluent being in the range of from about 0.1 to about 10 volume percent and (b) neutralizing the resulting surface sulfonated article with a neutralizing agent, whereby an amount of between about 0.001 and about 10 milligrams per cm^2 of sulfur trioxide equivalents in the form of neutralized sulfonic acid groups are produced on the surface of said article whereby the article remains transparent.

3,959,562

FILM BACKINGS PREPARED FROM THERMOPLASTIC POLYESTER-URETHANE ELASTOMERS AND PHENOXY RESINS

Robert H. Hackhel, 414 Hickory, Lombard, Ill. 60148

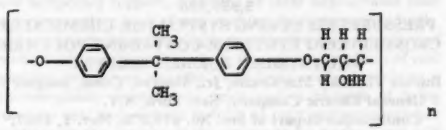
Division of Ser. No. 285,434, Aug. 31, 1972, abandoned. This application Nov. 6, 1973, Ser. No. 413,286

The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.

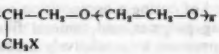
Int. Cl.² C09J 7/02

U.S. Cl. 428—423 **5 Claims**

1. A solvent resistant adhesive tape consisting of a solvent resistant flexible backing having supported thereon a solvent resistant pressure sensitive adhesive, said flexible backing comprising a thermoplastic, essentially linear polyester urethane elastomer and a thermoplastic phenoxy resin having the formula



wherein *n* is an integer from 50 to 150, said phenoxy resin being present in an amount from about 35 to about 100 parts per 100 parts by weight of said polyester-urethane elastomer, said solvent resistant pressure sensitive adhesive consisting essentially of a mixture of about 30–150 parts of a thermoplastic, polyketone resin per 100 parts of an elastomeric epihalohydrin polymer wherein said elastomeric epihalohydrin polymer comprises recurring units having the formula:



wherein X is chlorine or bromine and *n* is zero to 2, and said polyketone resin comprises the condensation product of an aliphatic ketone having a total of 3 to 6 carbon atoms; a monoaryl alkyl ketone having from 6 to 10 ring carbon atoms in the aryl group and from 1 to 4 carbon atoms in the alkyl group; an aliphatic ketone having a total of 3 to 6 carbon atoms with a lower aliphatic aldehyde; a monoaryl alkyl ketone having from 6 to 10 ring carbon atoms in the aryl group and from 1 to 4 carbon atoms in the alkyl group with a lower aliphatic aldehyde; or a carboxyclic ketone having 3 to 7 ring carbon atoms with a lower aliphatic aldehyde.

3,959,563

METHOD FOR RENDERING VITREOUS SURFACES WATER REPELLANT AND DIRT DEPOSIT RESISTANT AND ARTICLES PRODUCED THEREBY

Howard A. Vaughn, Jr., Schenectady, N.Y., and Vincent Vodicka, South Euclid, Ohio, assignors to General Electric Company, Waterford, N.Y.

Filed Nov. 2, 1973, Ser. No. 412,268
Int. Cl.² B32B *17/06*
U.S. Cl. 428—429 41 Claims

1. A method for producing water repellant and dirt deposit resistant characteristics on a vitreous surface of an article, the method comprising:

a. heating an article having a vitreous surface to a surface temperature of above about 400°C. until the surface of said article is substantially free of water;

b. adjusting the surface temperature of said article to from about 310° to about 370°C. and applying to the surface of said article a siliconizing medium comprising an organosiloxane having at least one silicon-carbon bond; and

c. allowing said article to cool to ambient temperature.

3,959,564

METHOD FOR THE PRELIMINARY TREATMENT OF PLASTIC SURFACES FOR ELECTROPLATING

Kurt Heymann, and Gunter Woldt, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Continuation-in-part of Ser. No. 273,031, July 19, 1972, abandoned, which is a continuation of Ser. No. 63,900, Aug. 14, 1970, abandoned. This application Feb. 6, 1974, Ser. No. 440,192
Claims priority, application Germany, Sept. 25, 1969, 1949278
Int. Cl.² B05D *1/18, 3/10*
U.S. Cl. 427—430 4 Claims

1. Process for the selective pickling and activation of the surface of an organic plastic material comprising the steps of:

a. providing an aqueous pickling and activating bath containing from about 20 to about 40 weight per cent of sulfuric acid, from about 15 to about 30 weight per cent of chromic acid, and from about 0.001 to about 1 weight per cent of a noble metal ion in the form of a soluble chloride salt, balance water;

b. boiling said bath for a period of time sufficient to effect removal of substantially all free chlorine present;

c. contacting said plastic surface with said substantially chlorine-free bath to effect pickling and activation thereof.

3,959,565

TIN OXIDE COATING

John F. Jordan, and Curtis M. Lampkin, both of El Paso, Tex., assignors to D. H. Baldwin Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 431,705, Jan. 8, 1974, Pat. No. 3,880,633. This application Sept. 12, 1974, Ser. No. 505,364
Int. Cl.² B32B *15/00;* B05D *5/12*
U.S. Cl. 428—432 8 Claims

1. A method of forming a conductive film of SnO_x on a window glass surface comprising:

maintaining the temperature of said surface constant at a temperature of about 950°F by floating said glass in a heated liquid bath;

spraying onto said glass surface an anhydrous solution containing anhydrous $SnCl_3$;

said spraying being conducted in an oxygen containing atmosphere, in successive, intermittent passes over said surface, each of said passes spraying only a portion of said glass surface at any instant of time, and at a rate of spray so that said temperature remains essentially constant;

said spraying further being conducted for a total time sufficient to form a film of SnO_x of about 0.3 to 0.6 microns in thickness.

3,959,566

PROCESS FOR PREPARING POLYMERIC SURFACES TO IMPROVE ANTISTATIC AND SOIL RESISTANT PROPERTIES

William James Pangonis, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 21, 1974, Ser. No. 516,486
Int. Cl.² B05D *3/02;* B32B *9/04*
U.S. Cl. 428—446 7 Claims

1. In a method of preparing the surface of a polymeric shaped article to improve the antistatic and soil resistant properties thereof comprising the steps of:

a. forming an aqueous silica sol having particle sizes in the range of about 15 to 40 angstroms,

b. applying the silica as a coating from an aqueous medium on the surface of said article, and

c. removing the aqueous medium; wherein the improvement comprises:

1. consolidating the fine particles of said silica sol formed in step (a) at a pH of about 8 to 9, and

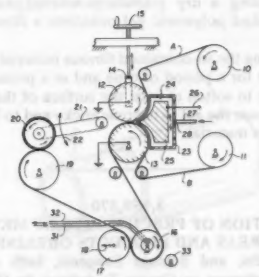
2. aging the sol resulting from said consolidation step at a pH in the range of about 3.5 to 6.6 for a period of time sufficient to form a dispersion having silica aggregations of at least 20 particles each.

3,959,567

METHOD AND APPARATUS FOR MAKING LAMINATES

Arthur Bradley, Floral Park, N.Y., assignor to Surface Activation Corporation, Westbury, N.Y.

Filed Sept. 12, 1974, Ser. No. 505,454
Int. Cl.² B29C *27/02;* B32B *27/06, 31/08*
U.S. Cl. 428—461 39 Claims



39. An apparatus for bonding shaped members, at least one of which is formed from a thermoplastic resin, comprising: means for exposing the surfaces of the shaped members to be bonded to low energy particles of a gas discharge plasma, means for bringing said surfaces together in face-to-face contact while exposed to said plasma and pressing them together to terminate the exposure to said plasma; means for heating said members; and means for pressing said heated members together.

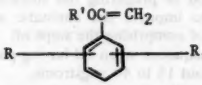
3,959,568

α-ALKOXYSTYRENE RESINOUS ADHESIVES AND LAMINATES

Harold Wayne Hill, Jr., and Charles W. Moberly, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 290,313, Sept. 19, 1972, Pat. No. 3,846,511. This application June 25, 1974, Ser. No. 482,879
Int. Cl.² B32B 15/08
U.S. Cl. 428—462 11 Claims

1. A plurality of layers having, between adjacent surfaces thereof as a bonding material therefor, a resinous graft copolymer product produced by copolymerizing (a) an alpha-alkoxystyrene represented by the formula



wherein each R is selected from hydrogen, methyl, and ethyl, and R′ is an alkyl radical having 1 to 6 carbon atoms, and (b) acrylonitrile and/or methacrylonitrile in (c) a solution or liquid suspension of a synthetic rubber prepared by polymerization of conjugated dienes or copolymerization of conjugated dienes with another monomer in the presence of a free radical polymerization initiator wherein the amount of ingredients in the resinous copolymer product are 20–45 weight percent of the resin derived from rubber, 35–50 weight percent of the resin derived from alpha-alkoxystyrene, and 20–35 weight percent of the resin derived from acrylonitrile and/or methacrylonitrile.

3,959,569

PREPARATION OF WATER-ABSORBENT ARTICLES

Nelson D. Burkholder, Jr., Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 58,712, July 27, 1970, abandoned. This application Aug. 2, 1974, Ser. No. 494,267
Int. Cl.² B44D 1/44, 1/22
U.S. Cl. 428—475 11 Claims

1. A process for preparing water-absorbent articles consisting essentially of:

a. distributing a dry granular/powdered water-swellable cross-linked polymeric gel onto/into a fibrous material, and

b. subjecting the so-contained fibrous material to the action of steam for a period of time and at a pressure and temperature to soften at least the surface of the gel,

thereby to cause the gel to become sticky and to firmly adhere to the fibrous material.

3,959,570

APPLICATION OF PRECIPITATES OF METHYLENE UREAS AND PRODUCTS OBTAINED

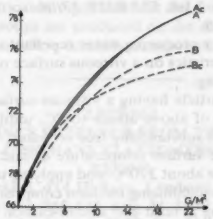
Guy Jacquelin, and Solange Sangenis, both of Grenoble, France, assignors to Centre Technique de l'Industrie des Papiers Cartons et Celluloses, Grenoble Cedex, France

Continuation-in-part of Ser. No. 41,374, May 28, 1970, Pat. No. 3,869,311. This application Oct. 24, 1974, Ser. No. 517,413
The portion of the term of this patent subsequent to Mar. 4, 1992, has been disclaimed.
Int. Cl.² B32B 9/02, 9/04; D21H 1/28
U.S. Cl. 428—478 12 Claims

5. A sheet coated with a pigmenting composition having as a base an insoluble and pulverulent methylene urea precipitate having a low degree of polymerization, the methylene urea precipitate having the following properties:

index of refraction between about 1.4 to 1.6,

diffuse reflection factor higher than 95% for an illumination of maximum wavelength between about 0.42 to 0.68 microns,



melting point between about 230° to 250° C.,

volume-mass between about 1.00 to 1.70 g/cu.cm.

pH value of the isoelectric point between about 4 to 7, and

a percent of nitrogen between about 30 to 38%.

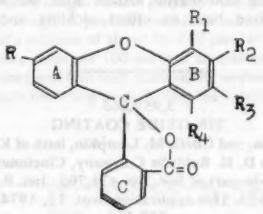
3,959,571

CHROMOGENIC FLUORAN DERIVATIVES AND THE PREPARATION AND USE THEREOF

Masakichi Yahagi, Tokyo; Shoichi Horiuchi, Fujimi; Takahumi Toyama, Tokyo; Akio Kashiwagi, Ageo; Teruo Suzuki, Tokyo; Tetsuo Igaki, Kawagoe; Kazuyuki Horisawa, and Mituhiro Shoji, both of Tokyo, all of Japan, assignors to Shin Nisso Kako Co., Ltd., Tokyo, Japan

Filed May 21, 1974, Ser. No. 472,204
Claims priority, application Japan, May 22, 1973, 48-56278; Aug. 22, 1973, 48-93260; Mar. 8, 1974, 49-26876
Int. Cl.² B41M 5/22
U.S. Cl. 428—537 2 Claims

1. A method of recording by development of color, which comprises intimately contacting at least one of fluoran derivatives of the formula,



wherein R is a piperidino group, a pyrrolidino group, a morpholino group, a methylpiperidino group, a cyclohexylamino group, an N-lower alkyl-cyclohexylamino group or an N-benzylcyclohexylamino group; R_1 is a hydrogen atom, a lower alkyl group, a substituted or unsubstituted amino group or a halogen atom; R_2 is a hydrogen atom, a lower alkyl group, a lower alkoxy group or a halogen atom; R_3 is a hydrogen atom, a C_{1-8} alkyl group, a phenyl group, a piperidino group, a methylpiperidino group, a pyrrolidino group, a morpholino group, a group of the formula

(where X represents a hydrogen atom, an acyl group, an alkyl group, a benzyl group, a cyclohexyl group or a substituted or unsubstituted aryl group; and Y represents a hydrogen atom, a lower alkyl group or a substituted or unsubstituted benzyl group), a halogen atom, an alkoxy group or a substituted or unsubstituted diphenylmethylamino group; and R_4 is a hydrogen atom, a lower alkyl group or an alkoxy group, provided that R_1 and R_2, and R_3 and R_4, may be groups represented by the formula —CH=CH—CH=CH—, and, in this case, the naphthalene ring may have a and the benzene ring C atom or a substituted or unsubstituted amino group, and the benzene ring C may have 1 to 4 halogen atoms, with an electron accepting material, thereby permitting said fluoran derivative to develop a color. provided that when R is piperidino, pyrrolidino, morpholino, cyclohexylamino or N-methylcyclohexylamino, at least one of R_1, R_2, R_3 and R_4 is a substituent other than H, lower alkyl and halogen.

3,959,572

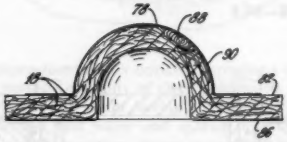
COATED MOLDED PANEL MEMBER

Daniel A. McCartan, Heath, and Neal A. Corcoran, Jr., Columbus, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 231,857, March 6, 1972. This application Aug. 22, 1974, Ser. No. 499,711

Int. Cl.² B32B *5/26, 5/28*

U.S. Cl. 428—172 **1 Claim**



1. A molded, decorative, rigid panel made of a densified mass of glass fibers bonded to one another by a thermo-setting binder, said panel having a three-dimensional, contoured front surface and having a three-dimensional, contoured back surface, most of said fibers being disposed generally parallel to the surfaces of the panel but with some fibers extending angularly to the front surface, said binder in said panel varying in concentration in portions of said panel, a sheet consisting essentially of heat-softened, rayon fibers and a binder, said sheet being from 3½ to 7 mils thick and weighing from ¼ to ¾ ounce per square yard, the fibers of the sheet being adhered to said front surface of said panel and conforming to the contour of said front surface, the fibers of said sheet being non-woven and generally oriented in a common direction, said sheet being yieldable in at least one direction generally parallel to the plane of the sheet prior to being adhered to said front surface, the thermo-setting binder that bonds the glass fibers of said panel together also adhering said rayon fiber sheet to said three-dimensional, front surface of said panel, said sheet bridging over spaces among the panel fibers adjacent the front surface of the panel and masking non-uniformity of the front surface caused by variations in binder content, and a substantially uniform layer of coating material on said sheet.

3,959,573

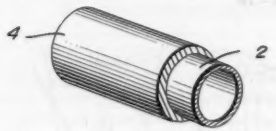
BIASABLE MEMBER AND METHOD FOR MAKING

Clifford O. Eddy, Webster; James A. Lentz, Penfield, and Stephen Strella, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 26, 1974, Ser. No. 464,397

Int. Cl.² G03G *15/00, 13/00*

U.S. Cl. 428—425 **27 Claims**



1. A member for electrically cooperating with a photoconductive support surface to attract charged toner particles from the support surface towards the member comprising a conductive substrate for supporting a uniform bias potential thereon and at least one coating comprising a resilient, hydrophobic elastomeric polyurethane, the coating being in contact with the conductive substrate, and having an electrical resistivity such that the coating is capable of transmitting a bias potential from the substrate to the outer periphery of the coating, the electrical resistivity of the hydrophobic elastomeric polyurethane being substantially insensitive to changes in relative humidity.

3,959,574

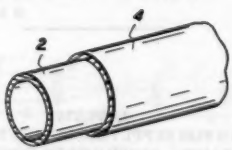
BIASABLE MEMBER AND METHOD FOR MAKING

Donald A. Seanor, Pittsford; James A. Lentz, Penfield; Clifford O. Eddy, Webster, and Stephen Strella, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 26, 1974, Ser. No. 464,396

Int. Cl.² G03G *13/00, 15/00*

U.S. Cl. 428—425 **31 Claims**



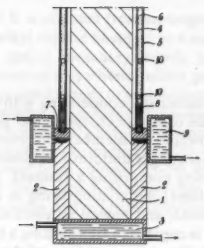
1. A member for electrically cooperating with a photoconductive surface to attract charged toner particles from the surface towards the member comprising a conductive substrate for supporting a uniform bias potential thereon and at least one coating comprising a resilient elastomeric polyurethane having an additive therein for controlling the resistivity of the elastomeric polyurethane, the coating being in contact with the conductive substrate, and having an electrical resistivity such that the coating is capable of transmitting a bias potential from the substrate to the outer periphery of the coating.

3,959,575

HOLLOW ANNULAR ELECTRODE FOR FEEDING POWDERED METAL TO ELECTROSLAG REMELTING PROCESSES

Eugenio Repetto, Genoa, and Aldo Ramacciotti, Rome, both of Italy, assignors to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed Oct. 11, 1974, Ser. No. 514,260
Claims priority, application Italy, Nov. 12, 1973, 53616/73
Int. Cl.² H05B 7/107
U.S. Cl. 13—18 4 Claims



1. A hollow annular electrode for feeding powdered metal to electroslag remelting processes, comprising a plurality of concentric cylindrical metal walls that are spaced apart from each other, spacer means holding said walls in predetermined spaced apart relationship, and a quantity of metal powder between said walls.

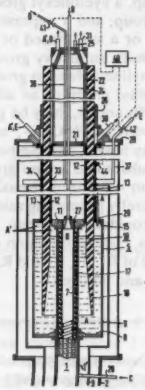
3,959,576

APPARATUS FOR SUPPLYING POWER TO ELECTRICAL DEVICES HAVING CONDUCTORS COOLED TO A LOW TEMPERATURE

Peter Penczynski, and Fritz Schmidt, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 25, 1975, Ser. No. 553,148
Claims priority, application Germany, Mar. 1, 1974, 2409868
Int. Cl.² H01B 7/34; H01L 39/00; H01B 12/00
U.S. Cl. 174—15 BH 19 Claims

1. A current supply apparatus for electrical devices having conductors cooled to a low temperature of the type in which the end of a cooled conductor is connected to one end of a conductor having its other end at a higher temperature, said conductor having its other end at a higher temperature being at least partially disposed in the gas flow of an evaporated coolant, wherein the improvement comprises means to supply a supplemental cold gas into the gas flow of the evaporated



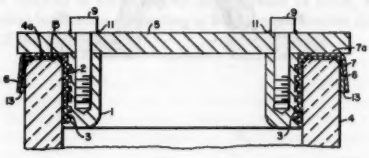
coolant at a temperature level above the evaporation temperature of the coolant.

3,959,577

HERMETIC SEALS FOR INSULATING-CASING STRUCTURES

Russell E. Frink, Forest Hills, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 10, 1974, Ser. No. 478,141
Int. Cl.² H05K 5/06
U.S. Cl. 174—50.5 11 Claims



1. In combination, a porcelain casing having a sand band on the inner surface thereof adjacent one end thereof, said porcelain casing additionally having a platinum band on the outer surface thereof adjacent the end thereof, a metallic adapter-ring cemented internally of said hollow porcelain casing to said internally-located sand band, an end metallic closure plate having a metallic flanged solder-ring affixed thereto, means securing said end metallic closure plate to said internally-located adapter-ring, and the solder-ring being affixed by a hermetic solder-seal to said externally-located platinum band.

3,959,578

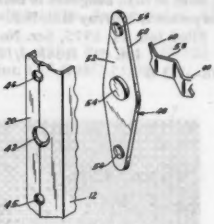
LIGHTING FIXTURE

Melbourne C. Reeves, Wheatridge, Colo., assignor to Keene Corporation, New York, N.Y.

Filed Apr. 9, 1975, Ser. No. 566,172
Int. Cl.² H05K 5/04
U.S. Cl. 174—65 R 8 Claims

1. An electrical lighting fixture comprising: a housing; fixture components contained within said housing; front and rear surfaces of said housing; a housing wall extending between said front and rear surfaces; a cable opening extending

through said wall; a plate positioned within said housing abutting said wall, said plate including a main body portion and



plug means extending outwardly from said body portion fitting in and filling said opening; and clip means securing said plate in position.

3,959,579

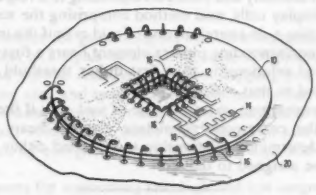
APERTURED SEMI-CONDUCTOR DEVICE MOUNTED ON A SUBSTRATE

Alfred H. Johnson, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 19, 1974, Ser. No. 498,342

Int. Cl.² H05K *1/18*

U.S. Cl. 174—68.5 **1 Claim**



1. A semiconductor wafer device comprising a semiconductor wafer having a plurality of circuit means on at least one surface thereof, said wafer having at least one aperture extending through said wafer and spaced inwardly from the periphery, substrate means, means connecting said wafer to said substrate in heat conductive relation therewith, said substrate means comprising alternate layers of insulating and conducting material, wiring connection means connected to said circuit means, extending through each aperture and connected to at least a selective one of said layers of conducting material and additional wiring connection means connected to said circuit means, extending over the periphery of said wafer and connected to at least a selected one of said layers of conductive material.

3,959,580

DIRECTLY VIEWABLE STEREOSCOPIC PROJECTION SYSTEM

Clifford J. Chocol, Engelwood, and Carl E. Polhemus, Lakewood, both of Colo., assignors to Martin Marietta Corporation, New York, N.Y.

Continuation of Ser. No. 389,764, Aug. 20, 1973, abandoned. This application Nov. 21, 1974, Ser. No. 525,905

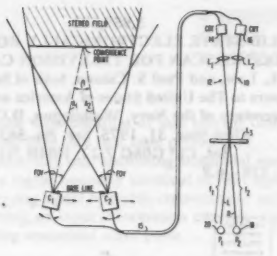
Int. Cl.² G02B *27/22*, *3/08*; G03B *35/00*; H04N *9/54*

U.S. Cl. 178—6.5 **3 Claims**

1. In a stereoscopic viewing system including stereoscopic inputs and an optical display system and wherein said optical display system includes a pair of optical trains, one for each input, and defining therebetween respective intersecting optical axes, a field lens forming a display screen and each optical train further including lens means cooperating with said field lens for focusing a respective stereo image at the intersection of said axes and for forming an exit pupil corresponding to said input respectively at a predetermined focal distance from said field lens such that a viewer situated at that distance from the field lens has his eyes coincident respectively with said exit pupils, the improvement wherein:

said stereoscopic inputs comprise separate television cameras,

said system includes means for mounting said cameras for movement laterally relative to each other on a base line facing the television camera field of view and for rotating each camera about an axis at right angles to the plane of the convergence point and the base line, for varying the



angle of convergence between said intersecting optical axes of said television cameras and for varying the field of view of the television cameras to improve the viewing comfort of the optical display system,

said system includes a pair of cathode ray tubes acting as stereo image projectors operatively coupled to said television cameras defining said stereoscopic input and being operatively positioned with respect to said pair of optical trains,

said field lens comprising a Fresnel lens facing the viewer and a composite lenticular lens facing said stereo projectors.

3,959,581

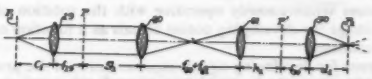
SELF-COMPENSATING FOCUS SYSTEM FOR OPTICAL VIDEO PLAYBACK DEVICE

Leonard J. Laub, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 29, 1975, Ser. No. 545,245

Int. Cl.² H04N *5/76*; G11B *7/12*

U.S. Cl. 178—6.6 R **6 Claims**



1. In a self-compensating focus system for an optical video playback device which includes a source of beam energy for reading a record having information stored in a track disposed thereon, said record having one surface that is a reflector and an oppositely disposed surface through which said reading beam may gain access to said track, the improvement which comprises:

means, including a plurality of mirrors, at least one of which is a semi-transparent mirror, for establishing an optical path between said reflector surface and said opposite surface for directing energy reflected from said surfaces;

means, included in said optical path, comprising a first lens having a predetermined focal length for focusing said reading beam of energy on said reflector surface of said record;

a second lens having a predetermined focal length, also included in said optical path, for focusing beam energy reflected from said reflector surface onto said track,

said first and second lenses being spaced apart a distance equal to the sum of their individual focal lengths to form an afocal optical relay for focusing said beam energy reflected from said reflector surface onto said track,

the ratio of the numerical aperture of said second lens to the numerical aperture of said first lens being substantially equal to 2, and

photoreceptor means disposed adjacent said semi-transparent mirror and responsive to beam energy reflected from said track for deriving an output signal representative of the information stored in said track.

3,959,582

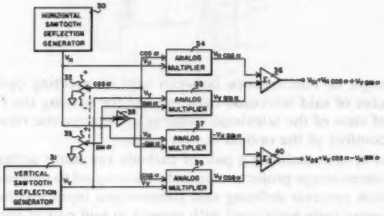
SOLID STATE ELECTRONICALLY ROTATABLE RASTER SCAN FOR TELEVISION CAMERAS

Robert L. Law, and Paul S. Catano, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 31, 1975, Ser. No. 563,907

Int. Cl.² G06G 7/22; H04N 7/18

U.S. Cl. 178—6.8 **6 Claims**



1. A system for electronically derotating a rotating image comprising:

A stationary sensor repetitively scanning said rotating image in a predetermined raster format for developing video signals as a function of the instantaneous light intensity of said image,

said sensor having vertical and horizontal deflection means for controlling said scanning;

means for generating substantially linear vertical and horizontal sawtooth deflection signals;

means synchronously operative with the rotation of said image for developing sine signals as a function of said rotation;

means synchronously operative with the rotation of said image for developing cosine signals as a function of said rotation;

means for developing signals representative of the products of said vertical and horizontal deflection signals each multiplied by each of said sine and cosine signals;

means for summing the signal representative of said horizontal deflection signal multiplied by said cosine signal with said vertical deflection signal multiplied by said sine signal;

means for subtracting the signal representative of said horizontal deflection signal multiplied by said sine signal from said vertical deflection signal multiplied by said cosine signal;

means for applying said sum and difference signals to said vertical and horizontal deflection means, respectively; and

a cathode ray tube synchronously operative with the repetitive scanning of said sensor and connected to receive said video signals for visual presentation of said image in derotated form.

3,959,583

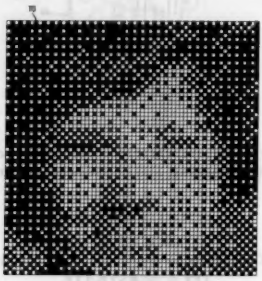
ANIMATED DITHERED DISPLAY SYSTEMS

Charles Norris Judice, Lincroft, and Charles Sheldon Roberts, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 21, 1975, Ser. No. 542,862

Int. Cl.² H04N 3/14

U.S. Cl. 178—7.3 D **24 Claims**



1. In a display system including a plurality of selectively energized and de-energized bi-level display cells, a method for representing a matrix of picture elements each having a predetermined intensity and each corresponding to a respective one of said display cells, said method comprising the steps of

energizing a de-energized one of said cells if the intensity of the corresponding picture element bears a first predetermined relationship to a first dither threshold value assigned to that cell, and

de-energizing an energized one of said cells if the intensity of the corresponding picture element bears a second predetermined relationship to a second dither threshold value assigned to that cell.

3,959,584

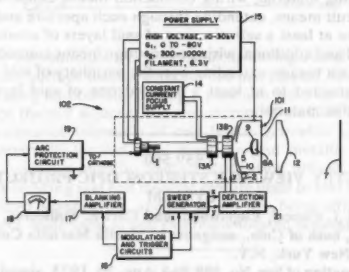
CATHODOCHROMIC CRT PROJECTION DISPLAY

Lee T. Todd, Jr., Lexington, Ky., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed July 19, 1974, Ser. No. 489,965

Int. Cl.² H01J 29/89

U.S. Cl. 178—7.88 **20 Claims**

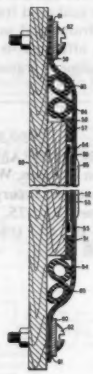


1. A cathode ray tube system that comprises a cathode ray tube having cathodochromic image screen means, means for directing an electron beam upon the image screen means thereby to write an image upon the image screen means, and means for projecting the image from the image screen surface upon which the electron beam first impinges, said surface being the part of the image screen means that gets the hottest due to the impinging beam.

3,959,585
GRAPHICAL INPUT TERMINAL

Hans George Mattes, Ocean Township, Monmouth County, and Gabor Peter Torok, Lincroft, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 1, 1974, Ser. No. 438,723
Int. Cl.² G08C 21/00
U.S. Cl. 178—18 **6 Claims**



1. Apparatus for generating an electrical representation of the location of a stylus on a writing area, comprising

first and second resistive sheets overlapping in a common writing area and spaced apart from each other by a gap, said sheets adapted for contact with each other at a point on said writing area under the pressure of said stylus,

a source of energizing potential having high and low outputs,

first means for connecting said high and low outputs across said first resistive sheet to generate a first voltage gradient across said first sheet in a first direction,

second means for connecting said high and low outputs across said second resistive sheet to generate a second voltage gradient across said second sheet in a second direction different from said first direction,

each point on said writing area thereby being uniquely defined by a unique combination of voltages on said first and second resistive sheets at said point,

third means for alternately actuating said first and second means, thereby defining alternate time intervals during which one of said resistive sheets is energized and the other one of said resistive sheets is nonenergized,

an output circuit, and

fourth means for connecting said nonenergized resistive sheet to said output circuit during at least one portion of said time interval in which said sheet is nonenergized, wherein said gap includes a layer of material which is an electrical insulator in the absence of pressure applied thereto and an electrical conductor in the presence of pressure applied thereto.

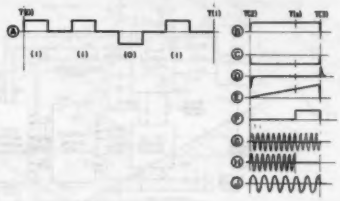
3,959,586
FREQUENCY BURST COMMUNICATION SYSTEM

Robert William Blomenkamp, Palo Alto, Calif., assignor to Physics International Company, San Leandro, Calif.

Filed Oct. 30, 1972, Ser. No. 302,196
Int. Cl.² H04L 27/00
U.S. Cl. 178—66 R **20 Claims**

1. A communication system comprising

means for converting an input information carrying signal having a predetermined number of units of information occurring in a first predetermined time period into an oscillating sinusoidal wave pulse occurring during a second predetermined time period after said first time period, said second time period beginning after the end of said first time period, said oscillating sinusoidal wave pulse having a particular time duration corresponding to the particular combination of said predetermined number of units of information occurring in said first time period,



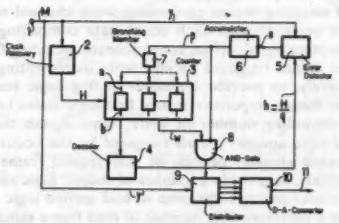
the maximum time duration of said second time period being shorter than said first time period, and

means for converting said oscillating sinusoidal wave pulse back into a signal operably identical to said input information carrying signal operably connected to said means for converting an input information carrying signal into an oscillating sinusoidal wave pulse.

3,959,587
DEVICE FOR SYNCHRONIZING A RECEIVER OF NUMERICAL DATA

Bernard Allias, Bretigny-sur-Orge, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed July 6, 1973, Ser. No. 377,022
Claims priority, application France, July 7, 1972, 72.24753
Int. Cl.² H04L 7/00; G06F 11/00
U.S. Cl. 178—69.5 R **17 Claims**

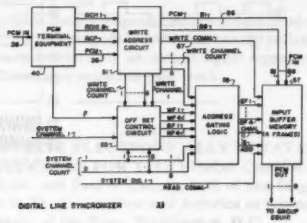


1. A device for the synchronization of a received transmission of successive messages formed by coded pulses of l bits including a synchronization bit k for each message, comprising a counter having a capacity of q bits connected to count the coded pulses of said received transmission, said counter being capable of being preset to a selected count, decoder means connected to the output of said counter for providing a clock signal upon detection of each count k of each successive message, error detector means connected to receive said clock signal and said transmission of coded pulses for generating an error signal upon detection of an error in the value of said synchronization bit, presetting means responsive to the output of said error detector means for presetting said counter to said selected count in the case of detection of an error in the value of said synchronization bit by said error detector means, and output means for transmitting said successive messages of coded pulses in synchronism with said counter.

3,959,588
DIGITAL LINE SYNCHRONIZER

Michael J. Kelly, Melrose Park, and Satyan G. Pitroda, Villa Park, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 5, 1975, Ser. No. 574,808
Int. Cl.² H04L 7/00
U.S. Cl. 178—69.5 R **8 Claims**



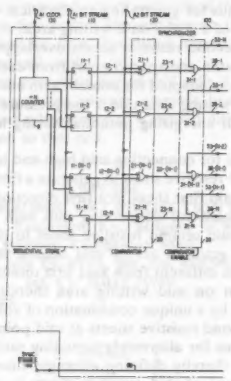
DIGITAL LINE SYNCHRONIZER

1. A digital line synchronizer for use with a synchronized pulse code modulated switching network having a plurality of connecting bidirectional signal lines, each carrying a PCM pulse data train comprised of a plurality of coded signals arranged in a first cyclic time frame format of repeating channel and frame periods and being switched through said network in time reference to a second cyclic time frame format of repeating channel and frame periods, said digital line synchronizer comprising write address means connected to one of said signal lines and including register means receiving thereto serially arranged coded signals of said first time frame format and providing therefrom said coded signals in a parallel arrangement, means for enabling the release of said parallel coded signals from said register means upon the occurrence of each completed channel period of said first frame format, means for generating a write command signal during a preselected portion of each channel period of said second frame format, counting means initiated by each repeating frame period of said first frame format and incremented thereafter with each completed channel period thereof, the count states of said counting means comprising write channel addresses and the occurrence of each count state comprising a write incrementing signal, off-set control means including first logic counter means triggered by said write incrementing signals, respectively, to provide a number of first logic states, first decoder means responsive to said first logic states to provide a corresponding number of write frame signals therefrom, second logic counter means triggered by the occurrence of preselected channel periods of said second frame format, respectively, to provide a number of second logic states, second decoder means responsive to said second logic states to provide a corresponding number of read frame signals therefrom, logic comparison means receiving preselected logic states from said first and said second logic counter means for comparing the logic states thereof for a first condition of equivalence, and receiving said write channel addresses together with the channel identifications of said second frame format comprising system channel addresses for comparing said write and said system channel addresses for a second condition of equivalence, first gating means responsive to either a loss of framing synchronization for said first frame format or to said first and second conditions of equivalence to reset said first logic states of said first logic counter means to a predetermined logic relationship with respect to said second logic states of said second logic counter means whereby the write frame signal from said first decoder means is selectively altered, address gating logic means including means for generating a read command signal during another preselected portion of each channel period of said second frame format and third decoder means receiving said write and said read frame signals and said write and said system channel addresses for alternate selection thereof, respectively, and input buffer memory means including a plurality of separate memory frames equal to the number of write frame signals and read frame signals, respectively, each memory frame having a plurality of memory storage means equal to the number of channel periods of said first and second frame formats, respectively, and further receiving thereto said released parallel coded signals from said register means and storing the same upon receipt of said write command signals from said generating means therefor, and providing said coded signals as PCM data outputs therefrom upon receipt of said read command signals, said write or said read frame signals being effective to select said memory frame and said write or said system channel addresses being effective to select said memory storage means within said memory frame.

3,959,589
DIGITAL BIT STREAM SYNCHRONIZER

Charles Alphonse von Roesgen, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 23, 1975, Ser. No. 589,333
Int. Cl.² H04L 7/08
U.S. Cl. 178—69.5 R **17 Claims**



1. In a digital data communication system, a circuit for synchronizing a plurality of bit streams, said circuit including a comparator for comparing a first bit of a first bit stream with a second bit of a second bit stream and characterized in that said circuit further comprises:

means for comparing said second bit with each of a plurality of bits of said first bit stream and, responsive to a mismatch therebetween, for generating respective mismatch signals,

a memory having a plurality of registers,

means responsive to said comparing means for extending each said bit mismatch signal through a corresponding first register of said memory to a second register thereof, and

means responsive to said extending means for determining when said bit mismatch signals have been extended through all but one of said registers.

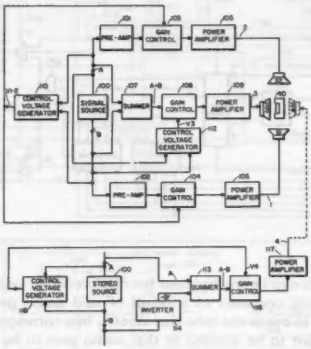
3,959,590
STEREOPHONIC SOUND SYSTEM

Peter Scheiber, 1987 Crompond Rd., Peekskill, N.Y. 10566

Continuation-in-part of Ser. No. 697,103, Jan. 11, 1969, abandoned, Continuation-in-part of Ser. No. 270,184, July 10, 1972, and a continuation-in-part of Ser. No. 46,345, June 15, 1970, Pat. No. 3,746,792, which is a continuation-in-part of Ser. No. 888,440, Dec. 29, 1969, Pat. No. 3,632,886. This application July 9, 1973, Ser. No. 377,723

Int. Cl.² H04R *5/00*

U.S. Cl. 179—1 GQ **17 Claims**



1. For use in a multidirectional sound reproduction system for producing fully directional audio information from only two recorded or transmitted stereo signals A and B, each having encoded thereon components of at least two input audio signals, sound reproducing apparatus, comprising:

first, second and third amplifiers connected to receive said A and B signals, at least said first amplifier being a gain controllable amplifier with separate audio and gain control inputs and receiving both of said A and B signals at said audio inputs, said second amplifier receiving at least said A signal, and said third amplifier receiving at least said B signal, said amplifiers being adapted to drive first, second and third loudspeakers, respectively, whereby said loudspeakers may be individually located to produce directional sound effects, and

means for comparing said A and B signals and for generating at least one gain control signal representative of the similarity therebetween, the output of said means for comparing being connected only to the gain control input of at least said gain controllable first amplifier to control the amplification of its signals and, consequently, the audio output level of said first loudspeaker for such signals.

3,959,591
TELEPHONE ANSWERING APPARATUS

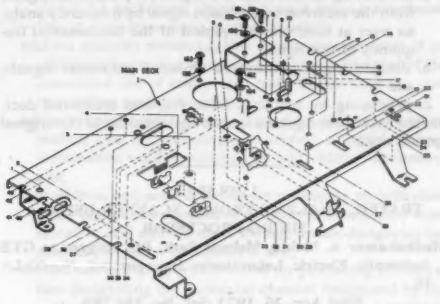
James R. Darwood, Paramount, Calif., assignor to T.A.D. Avanti, Inc., Paramount, Calif.

Filed June 24, 1974, Ser. No. 481,966

Int. Cl.² H04M *1/64;* **G11B** *23/04, 15/68*

U.S. Cl. 179—6 R **8 Claims**

1. A telephone answering apparatus including in combination: means mounted in said apparatus for receiving a removable magnetic message tape unit; capstan drive means mounted in said apparatus on one side of the path of the magnetic message tape from said unit for driving the message tape; a first plate slidably mounted in the apparatus; a pinch roller assembly mounted on said plate on the opposite side of the path of said message tape from said capstan drive means; electromagnetic transducer means mounted on said plate; first solenoid means; resilient means mechanically coupling the first solenoid means to said plate for selectively causing the pinch roller assembly to move the message tape into driving engagement with the capstan drive means and for simultaneously moving the electromagnetic transducer means into



operating relationship with the message tape when the first solenoid means is energized; and further resilient means coupled to said plate for pulling the pinch roller assembly back from the capstan drive means when the first solenoid is de-energized.

3,959,592
METHOD AND APPARATUS FOR TRANSMITTING AND RECEIVING ELECTRICAL SPEECH SIGNALS TRANSMITTED IN CIPHERED OR CODED FORM

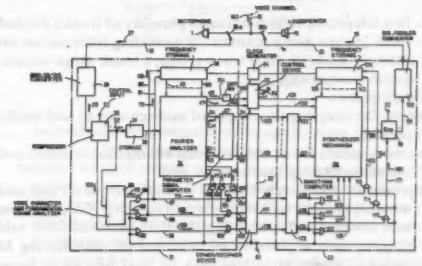
Kurt Ehrat, Zurich, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Dec. 17, 1973, Ser. No. 425,608

Claims priority, application Switzerland, Dec. 21, 1972, 18628/72

Int. Cl.² H04K *1/04*

U.S. Cl. 179—1.5 E **35 Claims**



1. A method of transmitting and receiving electrical speech signals transmitted in ciphered form from a transmitter to a receiver,

l. wherein at the transmitter end there are carried out the steps of:

a. forming from the speech signal at intervals to be transmitted parameter signals containing frequency spectrum-, voiced/voiceless information- and fundamental sound pitch coefficients;

b. ciphering said parameter signals;

c. forming a mixture of harmonic frequencies of a fundamental frequency with a fundamental period which is constant at least for each signal interval;

d. determining by means of the ciphered parameter signals the amplitudes of said individual harmonic frequencies in each signal interval;

e. transforming the ciphered parameter signals into a transmission signal;

f. transmitting the transmission signal from the transmitter to the receiver; and

II. wherein at the receiver end there are carried out the steps of:

a. recovering at intervals the ciphered parameter signals from the received transmission signal by frequency analysis over at least one full period of the fundamental frequency of this signal;

b. deciphering the recovered ciphered parameter signals; and

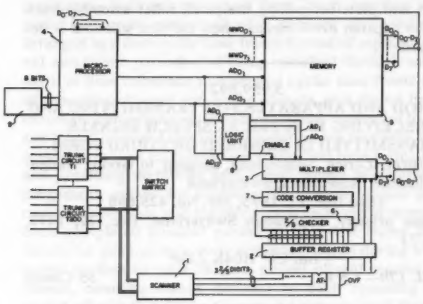
c. producing by synthesis from the thus recovered deciphered parameter signals a speech signal similar to the original speech signal.

3,959,593

TRAFFIC ANALYSIS FROM A SCANNER USING A MICRO-PROCESSOR

Madhukumar A. Mehta, Melrose Park, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Apr. 25, 1973, Ser. No. 354,289
Int. Cl.² H04M 3/24
U.S. Cl. 179—8 A **7 Claims**



1. In a telephone system having a plurality of trunks divided into trunk groups and a scanner for providing information on call attempts made on each trunk group, a trunk usage recording system comprising:

a multiplexer;

means for coupling the output of said scanner to said multiplexer;

memory means for storing said call attempt information and system operating instructions; and

a processor operatively coupled to said multiplexer and said memory means, said multiplexer receiving N inputs from said scanner and formatting the data received from said scanner into a plurality of data groups each having M outputs, where M is less than N, said processor being responsive to instructions from said memory means to read the output from said multiplexer and upon receipt of a call attempt indication from said multiplexer, converting said call attempt indication into an address for incrementing said memory means.

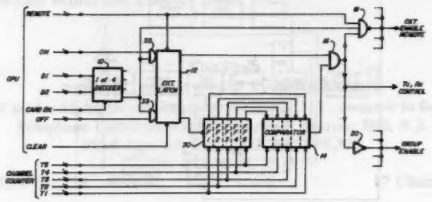
3,959,594

ARRANGEMENT AND METHOD FOR THE LOCALIZED SELF-CONTROL OF RANDOMLY ALLOTTED TIME SLOTS TO AUDIO PORTS

Dinesh K. Srivastava, Westmont, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed July 1, 1974, Ser. No. 484,390
Int. Cl.² H04J 3/00
U.S. Cl. 179—15 AQ **9 Claims**

1. In a time-shared communication switching system having a plurality of audio ports, each of which has gating means for coupling audio signals to a common transmission medium, channel counter means for providing a plurality of time slot identity bits, each defining a distinct time slot, and a common control for addressing and providing control signals to said audio ports, the improvement comprising a memory and control means including comparator means associated with each of said audio ports, said plurality of time slotted identity bits being coupled in multiple to said audio ports, said audio ports each being addressed by the common control in a specific time slot intended to be allotted to that audio port, any one of said audio ports allottable to any time slot, with said allotment being in a random fashion, a plurality of said audio ports addressable during the same time slot whereby any number of



audio ports can be multiplexed for conferencing, said control means being operated as a result of said audio port being addressed to cause the time slot identity bits corresponding to the time slot to be allotted to that audio port to be coupled into and stored in said memory, said comparator means comprising said stored time slot identity bits with each of said plurality of time slot identity bits coupled in multiple to said audio ports and upon determining a match enabling the gating means during the allotted time slot to couple the audio signals onto the common transmission medium, whereby said allotted time slot identity is stored and subsequently used independently of the common control to gate the audio signals onto the common transmission medium.

3,959,595

DIGITAL SIGNAL MULTIPLEXER/CONCENTRATOR

Donald Cameron Smith, Bloomington, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 9, 1975, Ser. No. 539,573
Int. Cl.² H04J 3/06
U.S. Cl. 179—15 BA **7 Claims**

1. A digital signal concentrator coupling an input channel, said input channel transmitting data bits at a frequency F_a, to an output channel, said output channel transmitting data bits at a predetermined frequency F_0, where $F_0 > F_a$, comprising:

first and second similar sections A and B;

steering means coupled to said input channel for alternatively steering the data bits carried by said input channel at a frequency F_a to either section A or B over a fixed sample time T_S;

each of said first and second similar sections A and B comprising:

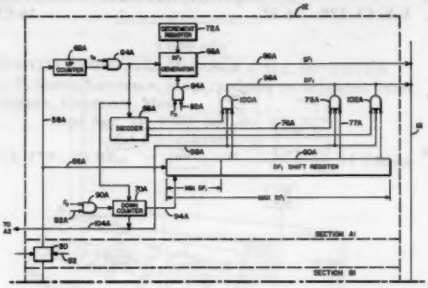
DF_a storage means responsively coupled to said steering means and of a sufficient capacity to store at least the maximum number of data bits that is expected to be received from said input channel over said fixed sample time T_S;

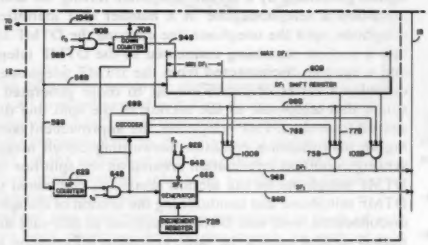
first counter means responsively coupled to said steering means and counting the actual number of data bits that is received from said input channel over said fixed sample time T_S for generating an actual bit count thereof;

SF_a generator means;

decrementing means coupled to said SF_a generator means for coupling thereto a minimum bit count that is representative of the minimum number of data bits that is expected to be received from said input channel over said fixed sample time T_S;

said SF_n generator means receiving said minimum bit count from said decrementing means and said actual bit count from said first counter means for generating a sub-field SF_n that is an encoded representation of said actual bit count less said minimum bit count and coupling the bits of said sub-field SF_n held in said SF_n





generator means to said output channel at said output frequency F_0;

switching means responsively coupled to said first counter means and said DF_n storage means for coupling the data bits of said data field DF_n held in said DF_n storage means to said output channel at said output frequency F_0.

3,959,596

TIME DIVISION SWITCHING NETWORK

Robert J. Bojanek, Brookline; Robert G. Field, Millis, and Marvin S. Mason, Lexington, all of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 30, 1975, Ser. No. 582,258

Int. Cl.² H04Q *11/04*

U.S. Cl. 179—15 AT **17 Claims**

1. In a communication system including a plurality of input transmission lines for carrying time division multiplexed digital signals in a predetermined number of input channels on each input transmission line and a plurality of output transmission lines for carrying time division multiplexed digital signals in an equal predetermined number of output channels on each output transmission line, a time division switching network for establishing connections between selected input channels of selected input transmission lines and selected output channels of selected output transmission lines comprising

an address information line for transmitting digital address information words each having a first segment designating a particular one of each of said pluralities of transmission lines and a particular one of said predetermined number of channels of each transmission line and a second segment designating a particular one of each of said pluralities of transmission lines and a particular one of said predetermined number of channels of each transmission line;

a plurality of switching matrices, each switching matrix being coupled to each of the plurality of input transmission lines and to a different one of said plurality of output transmission lines, and each switching matrix including:

data memory means coupled to each of said plurality of input transmission lines and capable of storing a digital signal for each input channel of each input transmission line at a corresponding storage location;

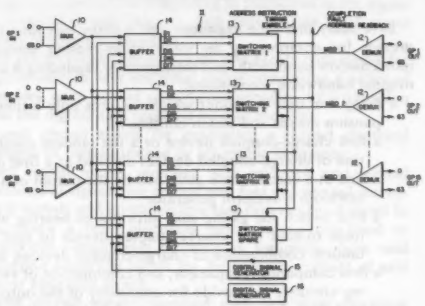
address memory means capable of storing a segment of an address information word for each output channel of the associated one of said output transmission lines at a corresponding storage location;

address input storage means coupled to said address information line for receiving and storing a digital address information word transmitted on said address information line;

first address comparison means for producing an indication when the second segment of an address information word stored in said address input storage means designates the associated output transmission line;

second address comparison means for producing an indication designating the particular channel designated by the second segment of an address information word stored in said address input storage means;

address memory input control means coupled to the address input storage means, to the first address comparison means, to the second address comparison means, and to the address memory means for causing the address memory means in response to indications from the first and



second address comparison means to store the first segment of the address information word;

memory address control means coupled to the data memory means and to the address memory means for addressing the respective storage locations in recurring sequence by corresponding channels and causing the data memory means to store digital signals at the storage locations corresponding to the associated input channel, said memory address control means causing the first segment of an address information word being stored in the address memory means to be stored in the storage location corresponding to the channel designated by the second segment of the address information word;

address memory output means coupled to the address memory means for reading out the first segment of an address information word stored at the storage location addressed by the memory address control means;

said memory address control means being coupled to the address memory output means for addressing the storage locations of the data memory means corresponding to the channel designated by the first segment of an address information word read out of the address memory means by the address memory output means; and

data output means coupled to the data memory means for reading out the digital signals at the storage locations in the data memory means addressed by the memory address control means and corresponding to the channel designated by the first segment of the address information

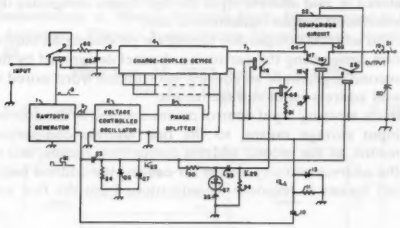
word read out of the address memory means, for selecting the particular digital signal associated with the particular input transmission line designated by the first segment of the address information word read out of the address memory means, and for applying the selected digital signal to the associated output transmission line in the output channel designated by the second segment of the address information word.

3,959,597

DELAY LINE TIME COMPRESSOR AND EXPANDER

Bernhard E. Keiser, 2046 Carrhill Road, Vienna, Va. 22180

Filed Apr. 15, 1975, Ser. No. 568,253
Int. Cl.² H04B 1/66
U.S. Cl. 179—15.55 T 3 Claims



1. A delay line time expander and a delay line time compressor for compressing an information-bearing waveform into a narrow bandwidth, and subsequently expanding it to the original bandwidth, comprising:

a delay line time expander which requires only a time expansion means and which consists of:

a first charge-coupled device or a fist tandem combination of charge-coupled devices clocked as a first delay line at a variable rate governed by the output of a first sawtooth waveform generator;

a first switch for gating said information-bearing waveform to said first charge-coupled device or said first tandem combination of charge-coupled devices; and,

a first comparator, capacitor, and combination of switching circuitry to provide for continuity of the output of said first delay-line time expander during the delay flyback of said first charge-coupled device or said first tandem combination of charge-coupled devices, thus providing a time-expanded version of said information-bearing waveform; and,

a delay line time compressor which requires only a time compression means and a cycle repetition means, said delay line time compressor consisting of:

a second charge-coupled device or a second tandem combination of charge-coupled devices clocked as a second delay line at a variable rate governed by the output of a second sawtooth waveform generator whose repetition rate is the same as that of said first sawtooth waveform generator;

a second switch for gating the bandwidth-compressed information-bearing waveform to said second charge-coupled device or said second tandem combination of charge-coupled devices; and,

a second comparator and combination of switching circuitry to provide for continuity of the output of said second delay line time compressor during the delay flyback of said second charge-coupled device or said second tandem combination of charge-coupled devices; and,

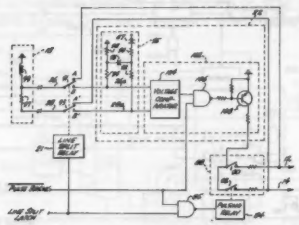
a cycle repetition means connected to the output of said second delay line time compressor providing an output in which each portion of the signal from said second delay line time compressor is repeated a plurality of times to reconstruct said information-bearing waveform.

3,959,598

IDENTIFICATION FORWARDING CIRCUIT FOR USE WITH TONE-TO-PULSE CONVERTERS

Daniel R. Asmussen, Kirkland, and Ray Ma, Seattle, both of Wash., assignors to Tel-Tone Corporation, Kirkland, Wash.

Filed Apr. 15, 1974, Ser. No. 460,711
Int. Cl.² H04M 15/36
U.S. Cl. 179—16 EC 16 Claims



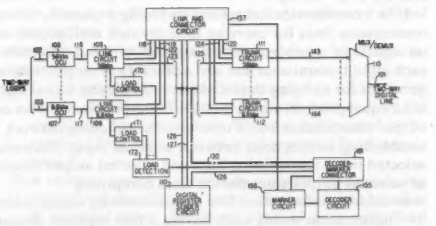
1. In a tone-to-pulse converter adapted to detect DTMF signals generated by a DTMF telephone having the ability to condition a telephone line in a manner that identifies the telephone, split the telephone line carrying the DTMF signals into a section remaining connected to the DTMF telephone and a section disconnected from the DTMF telephone, and outpulse a series of pulses similar to those generated by a rotary dial telephone to the section of the split line disconnected from the DTMF telephone, the improvement comprising an identification condition forwarding circuit means for sensing condition information created on the split line by the DTMF telephone on the section remaining connected to the DTMF telephone and conditioning the section of the split line disconnected from said DTMF telephone so that said disconnected section carries the same condition information as the section remaining connected to the DTMF telephone.

3,959,599

CALL INITIATION DELAY ARRANGEMENT FOR DIGITAL DATA SWITCHING SYSTEM

Donald Masco, Red Bank; Edward Joseph McNamara, Manalapan Township, Monmouth County; Arnold Chester McQuaide, Jr., Eatontown; Randolph John Pilc, Holmdel, and Peter Stephen Warwick, Middletown, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 14, 1975, Ser. No. 558,488
Int. Cl.² H04M 3/42; H04Q 3/42
U.S. Cl. 179—18 EB 15 Claims



1. In a switching system including transmission lines extending to subscribers, common control equipment for providing the service of extending calls from calling ones of the lines to called ones of the lines and means responsive to call initiating signals from each calling line for requesting the service of the common control equipment, the common control equipment being released from the calling line after each service attempt,

characterized by

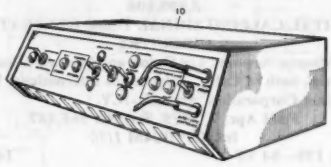
means jointly responsive to activity of the common control equipment exceeding a predetermined level within the activity capacity of the equipment and to each service attempt which fails to complete a call to a called line subscriber for rendering the calling line requesting means unresponsive to the call initiating signals.

3,959,600

REMOTELY PROGRAMMABLE CALL DIVERTER

Henry P. Sousa, Lawrence, Mass., assignor to Arlington Trust Company, Lawrence, Mass.

Filed Apr. 28, 1975, Ser. No. 572,027
Int. Cl.² H04M 3/54
U.S. Cl. 179—18 BE **11 Claims**



1. An improved remotely programmable automatic telephone call forwarding and switching device for connection to two telephone lines from at least one central exchange and for switching incoming calls on the first one of said lines to outgoing calls on the second of said lines thus diverting incoming calls to a predetermined telephone number programmed by the subscriber comprising:

improved ring detection means connected to each of said two lines, detecting only ringing signals on each of said lines and retaining an indication of said ring until the switching function initiated by said ring is completed;

first circuit means connected to said ring detection means to determine sequence of operations depending on which line a ring has been detected on;

line seizure means to seize each of said telephone lines;

improved dial tone detection means to detect the presence of a dial tone on each of said subscriber lines;

programmable memory means capable of storing representations of telephone numbers to which incoming telephone calls are to be diverted;

tone decoding means to convert touch dial tone signals to serial pulse data for said programmable memory means;

second circuit means for programming said memory means via said tone decoding means and for reading the pulse information out of said memory means to the dialing means of the second of said telephone lines, to dial out a telephone call to the telephone number stored in said memory;

improved audio bridging means to establish an audio path between the first of said telephone lines and the second of said telephone lines;

automatic bridging means to determine when an audio path between said telephone lines is to be established;

an interrupt means to pulse the first of said bridged lines which is activated to determine the termination of the call on the first of said bridged lines and to force the return of said dial tone;

an abort circuit means to reset said switching device after completion of a switching function for any reason;

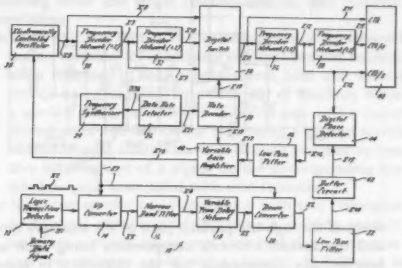
improved timing means connected to said ring detection means, said decoding means, said interrupt means, said read means, said dial tone detection means and said automatic bridging means to activate and terminate the operation of said means in a timed sequence compatible with telephone company equipment and operational standards.

3,959,601

VARIABLE RATE CLOCK SIGNAL RECOVERY CIRCUIT

Benjamin Olevsky, Andalusia; Jay W. Layer, Chester, both of Pa., and Keith L. Zerschling, assignors to Ford Motor Company, Dearborn, Mich.

Filed June 27, 1975, Ser. No. 591,225
Int. Cl.² H04L 7/00
U.S. Cl. 178—69.5 R **10 Claims**



1. A variable-rate clock-signal recovery circuit for a digital data receiver, said digital data receiver including means for generating a binary data signal having a characteristic which changes in a manner corresponding to transitions in the digital data received by said receiver, said variable-rate clock-signal recovery circuit comprising:

first circuit means, supplied with said binary data signal, for generating a first electrical signal comprising a series of pulses, each of said pulses corresponding to a transition in the digital data received by said receiver;

second circuit means for generating a second electrical signal of predetermined or selectable frequency;

third circuit means, supplied with said first and second electrical signals, for mixing said first and second electrical signals and up-converting said first electrical signal to produce a third electrical signal having side-band or spectral components differing in frequency from said second electrical signal by the spectral content of said first electrical signal;

fourth circuit means, supplied with said third electrical signal, for producing a fourth electrical signal of predetermined frequency, said fourth circuit means filtering said third electrical signal;

fifth circuit means, supplied with said second electrical signal and with said fourth electrical signal or a signal derived therefrom for mixing or down-converting said fourth electrical signal or signal derived therefrom to produce a fifth electrical signal having a frequency corresponding to the difference in frequencies of said second and fourth electrical signals and proportional to the clock rate of said binary data signal.

3,959,602

TELEPHONE SUBSTATION CIRCUIT

Joel Stanley Jayson, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 19, 1974, Ser. No. 525,209
Int. Cl.² H04M 1/00
U.S. Cl. 179—81 R **14 Claims**

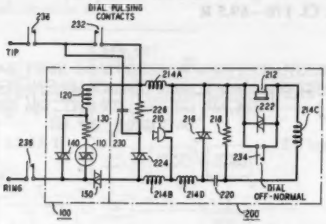
1. A telephone substation circuit comprising:

a speech network including a carbon transmitter, a receiver, and a hybrid coil comprising a plurality of mutually coupled windings connected to the transmitter and receiver in a conjugate relationship;

an auxiliary circuit connected in parallel with the speech network; and

means for connecting the auxiliary circuit and the speech network to an associated telephone line,

the auxiliary circuit being powered directly from the telephone line when the line connecting means is operated, the relative dc impedances of the auxiliary circuit and the speech network being such that at least one-fifth of the line current available in a longest telephone line loop is

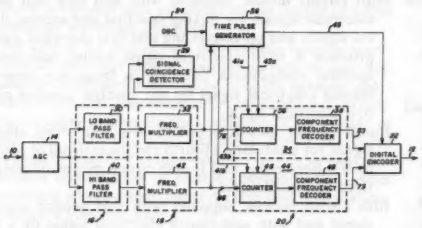


shunted through the parallel path of the auxiliary circuit, and the speech network components being such as to substantially compensate for the reduction in transmit level resulting from the reduced current flow through the transmitter.

3,959,603
DUAL TONE MULTIPLE FREQUENCY RECEIVER/DECODER

Albert G. Nilssen, Cupertino, and Burton R. Tunzi, Sunnyvale, both of Calif., assignors to Tone Technology Corporation, Sunnyvale, Calif.

Filed Oct. 29, 1974, Ser. No. 518,370
Int. Cl.² H04M 1/50
U.S. Cl. 179—84 VF **10 Claims**



1. Analog-to-digital decoding apparatus comprising:

input means for receiving an analog signal consisting of a first component of a frequency included in a first band of frequencies and a second component of a frequency included in a second band of frequencies;

first band pass filter means coupled to said input means and having a pass band including said first band of frequencies, said first filter means being operative to separate said first component from said analog signal and to develop a first component signal having a frequency corresponding to that of said first component;

second band pass filter means coupled to said input means and having a pass band including said second band of frequencies, said second filter means being operative to separate said second component from said analog signal and to develop a second component signal having a frequency corresponding to that of said second component;

means for detecting coincidence of occurrence of said first and second component signals and operative to develop a coincidence signal corresponding thereto;

pulse generating means responsive to said coincidence signal and operative to generate in sequence a start count signal, a stop count signal and an output enable signal, all having a predetermined time relationship;

first frequency identification decoding means responsive to said start count and stop count signals and operative to receive said first component signal and to develop a first decoded signal corresponding to said first component;

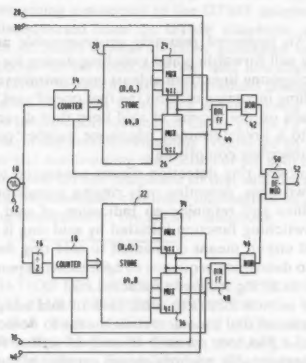
second frequency identification decoding means responsive to said start count and stop count signals and operative to receive said second component signal and to develop a second decoded signal corresponding to said second component; and

logic means responsive to said output enable signal and operative to receive said first and second decoded signals and to develop a digital output signal corresponding to the particular combination thereof.

3,959,604
DIGITAL CALLING SIGNAL TONE GENERATING CIRCUITRY

Harley Monroe Newsom, Los Gatos, and Michael Allen Patten, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 7, 1975, Ser. No. 565,487
Int. Cl.² H04M 1/50
U.S. Cl. 179—84 VF **14 Claims**



1. Digital calling signal tone generating circuitry comprising

electronic binary digital storing circuitry wherein binary data representing incremental changes in amplitude at substantially uniformly spaced points along a portion of a predetermined waveform are stored for a plurality of waves differing in frequency having addressing circuitry and data output circuitry from which binary data issues including control digits corresponding in time to the terminal digit of each stored waveform,

electronic counting circuitry coupled to said addressing circuitry of said storing circuitry for incrementally addressing the same and issuing said binary data from said output circuitry in a continuous train,

a source of clocking impulses of repetition rate greater than the highest frequency of said waves and coupled to said counting circuitry for advancing the same,

an electric circuit connection for conveying said control digits to said counting circuitry for resetting the same and thereby maintaining said continuous issue of data,

XOR gating circuitry having an input lead coupled to said data output circuitry, another input lead and having an output lead,

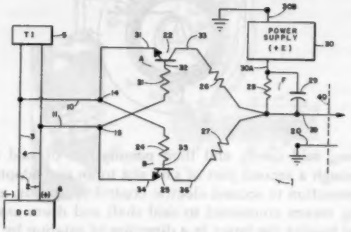
binary flip-flop circuitry having an input lead coupled to said output circuitry for accepting said control digit and an output lead coupled to said other input lead of said XOR gating circuitry, and

delta demodulating circuitry connected to the output lead of said XOR gating circuitry and having output terminals at which analog calling signal tones are delivered.

3,959,605
CIRCUIT FOR DETECTING LOSS OF TELEPHONE LINE VOLTAGE

John J. Jurschak, 825 Casazza Drive, Reno, Nev. 89502

Filed Sept. 11, 1974, Ser. No. 505,162
Int. Cl.² H04B 3/46
U.S. Cl. 179—175.3 R **5 Claims**



1. A telephone line voltage loss detection device for signalling attenuation of the potential between the wires of a telephone line, said device comprising in combination:

a. a nonpolar pair of mutually insulated contacts for bridging said device to said telephone line,

b. said device comprising dual line potential detectors, each of said detectors comprising a bipolar transistor and a resistor, and

being arranged to have the input of each said detector comprise the unilateral combination of its said resistor in serial connection with the base-emitter junction of its said transistor, and

said inputs being bilaterally connected across said contact pair, the polarity received by said contacts biasing one of said transistors on, the reversing of said polarity biasing said other transistor on; substantial attenuation of said potential therebetween cuts-off both of said transistors of which one is otherwise on,

c. circuit means connected to the collector outputs of said detectors, grounded power power supply means connected to said circuit means, said circuit means delivering an output signal which manifests the status of said line potential, and

filter means responsive to the usual transients on said telephone line delivered through said detector resistors for reducing the effects of said transients,

said output signal being referenced to earthground and electrically connectable to a suitable means for utilization.

3,959,606
INSTALLATION FOR CHECKING A REPEATER OF A TRANSMISSION ROUTE

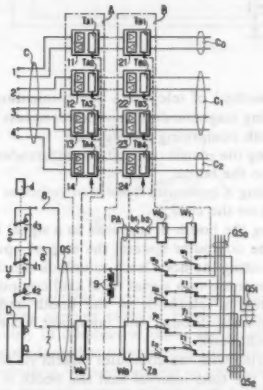
Pierre Merlet, Bourg-la-Reine; Jacques Vernezy, Viroflay, and Jean-Claude Barigot, Brie-Comte-Robert, all of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Oct. 4, 1974, Ser. No. 512,154
Claims priority, application France, Oct. 4, 1973, 73.35506
Int. Cl.² H04B 3/46
U.S. Cl. 179—175.31 R **14 Claims**

1. In an installation for checking a repeater related to a quad of a transmission route, said transmission route including n quads and being constituted by several sections of transmission cable, each of said sections of transmission cable being equipped with a plurality of repeater units related to said quads, said repeater units being spaced along the length of each section of said transmission cable, wherein said transmission route branches into different ones of said sections of transmission cable at predetermined ones of said repeater units, thereby forming a node, and said transmission route transmitting signals between a first terminal, at which said n quads are included in a single starting section of said transmission cable, and at most n second different terminals determined by said different sections of said transmission cable branching from said single starting section, said installation comprising:

in each repeater unit, a unit selection device for energizing a first terminal of a looping control element related to each repeater of said repeater unit, said unit selection device being supplied by a first pair of auxiliary wires of a service quad, called a unit selection pair, and a repeater circuit selection device for energizing a second terminal of said looping control element of each repeater by transitory interruption of a signal on the corresponding transmission quad associated with said repeater;

at least one service quad associated with said transmission route, said service quad including a starting section at said first terminal associated with said starting section of said transmission cable and a plurality of different sections of service quads branching at each node associated with said different branches of said transmission cable, each section of said service quad including said unit



selection pair, being subdivided along said transmission route at said nodes, and a second auxiliary pair of wires also being subdivided along said transmission route at said nodes;

at each node, a third auxiliary pair of wires, called a switching pair, for connecting an upstream section of said service quad to a downstream section of said service quad at said node, said third auxiliary pair of wires constituted from said upstream service quad by a first wire connected to the electrical middle point of an inductance connected between said second auxiliary pair of wires and a low potential second wire of said unit selection pair;

in each repeater unit at a node, selection devices for selecting one of said downstream sections of said service quads branching from said node, said selection devices being arranged in series, and each of said selection devices including at least one relay supplied by said third auxiliary pair for controlling switching elements connecting said upstream section of said service quad and said downstream sections of said service quad; and

a remote control device for supplying current gating pulses for respectively selecting one of said repeater units and a downstream section of said service quad at each node, said remote control device being switchably connected

between two access terminals of said unit selection pair of said starting section of said service quad and between said third auxiliary pair at each node.

3,959,607

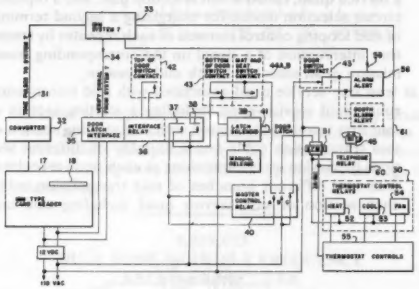
COMMUNICATIONS BOOTH WITH AUTOMATIC ACCOUNTING FOR TELEPHONE AND BOOTH USAGE

John H. Vargo, Verplanck, N.Y., assignor to Christopher Anthony Vargo, Verplanck, N.Y.

Continuation-in-part of Ser. No. 309,396, Nov. 24, 1972, abandoned. This application Feb. 12, 1975, Ser. No. 549,223

Int. Cl.[2] H04M *15/00*

U.S. Cl. 179—183 **6 Claims**



6. A method of telephone communication using a planar card having magnetic data thereon for access to a communications booth comprising the steps of:

inserting the planar card into a card reader mounted external to the booth;

activating a computer system in response to the magnetic data on the card;

opening the booth in response to a signal from a computer in the computer system; the step of opening comprising activating the door latch to unlock the door of the booth in response to a signal from said computer;

activating a telephone in the booth and connecting the telephone through the computer system to a central switchboard;

measuring with the computer system via telephone connection the time interval that the booth is occupied by the user as well as the total toll calls made on the telephone;

establishing via the telephone connection the start of the user's billing time charge for the rental of the booth and then automatically terminating the billing time as well as the telephone service and measured time interval when the user leaves the booth and closes the door; and

issuing a billing charge and statement to the user for the booth rental time as well as the toll calls.

3,959,608

REEL ARRANGEMENT FOR ELECTRIC WIRING

Thomas J. Finlayson, Palos Hills, Ill.; Michael H. Grace, Griffith, Ind., and George H. Smith, Hazelcrest, Ill., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 10, 1974, Ser. No. 531,291

Int. Cl.[2] H02G *11/00*

U.S. Cl. 191—12.2 R **7 Claims**

1. An electric conduit reel mechanism without slip rings comprising:

a stationary shaft adapted for mounting on a support, said shaft having a hollow part with an axially extending slot therein

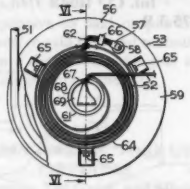
a drum assembly rotatably mounted on said shaft and including

a primary drum and

a secondary drum

a flexible multiple lead conduit wound about said primary drum having an outer end adapted for connection to first electric control apparatus,

a flat flexible multiple lead ribbon coiled within said secondary drum having its outer end connected to the inner end of said conduit and having a radially inner portion passing through a first part of said slot, passing axially



along said cavity and then passing out of said cavity through a second part of said slot to an end adapted for connection to second electric control apparatus, and

spring means connected to said shaft and drum assembly and biasing the latter in a direction of rotation by which said conduit is wound onto said primary drum, said ribbon being coiled from a relatively loose condition to a relatively tight condition when said drum assembly is rotated.

3,959,609

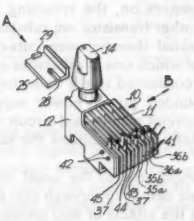
DOUBLE ACTION SWITCH WITH BLOCKING INSERT FOR ONE ACTION

Graham Stirling Laing, and Ronald Joseph Morrell, both of London, Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed Nov. 25, 1974, Ser. No. 527,046

Int. Cl.[2] H01H *9/00*

U.S. Cl. 200—4 **5 Claims**



1. A double acting switch comprising:

a frame including two spaced apart side members;

a first series of contact members mounted on said frame;

a second series of contact members mounted on said frame;

a shaft supported in said frame, said shaft mounted for rotational movement about a longitudinal axis of the shaft to actuate said first series of contact members and also for axial movement along said longitudinal axis to actuate said second series of contact members;

a removable and replaceable insert in said frame, said insert slidable into said frame between said spaced apart side members;

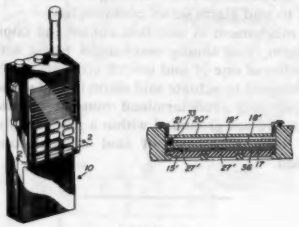
a formation on said shaft, and a cooperative formation in said insert, said formations interengaging, when said insert is in said frame, to prevent one of said rotational and axial movements and to permit the other of said rotational and axial movements of said shaft, removal of said insert permitting both said rotational and axial movements.

3,959,610

HERMETICALLY SEALED KEYBOARD TYPE ASSEMBLY WITH ELASTOMERIC ELECTRICAL CONNECTING LINK BETWEEN SWITCH AND COMPONENT MODULES

John P. Finnegan, Wheaton, Ill., and Bernard Gasparaitis, Fort Lauderdale, Fla., assignors to Motorola, Inc., Chicago, Ill.

Filed Dec. 13, 1974, Ser. No. 532,541
Int. Cl.² H01H 13/70, 1/58
U.S. Cl. 200—5 A 7 Claims



1. An electrical, multi-push button switch assembly comprising:

a. a housing defining a cavity with a wall between the cavity and a front surface, the wall having a plurality of openings therethrough;

b. a resilient pad having integral button portions corresponding in size and relative position with the openings in the wall of said housing protruding from one side thereof, said pad being positioned in the cavity of said housing in parallel, juxtaposition with said wall with the button portions protruding through the openings;

c. a sheet of electrically insulating material having openings therethrough corresponding in relative position with the button portions and positioned generally in overlying relationship to said resilient pad opposite the wall of said housing;

d. conductive means sandwiched between said resilient pad and said insulating sheet;

e. a first printed circuit board positioned in overlying relationship to said insulating sheet and having a plurality of contact areas on one side thereof corresponding in position with the openings in said insulating sheet, said contact areas being electrically connected to electrical terminals on the opposite side of said first printed circuit board and further being constructed to complete a circuit between a predetermined pair of the terminals upon depressing one of said button portions of said resilient pad to force said conductive means thereagainst;

f. a connecting link formed of a spacer of electrically insulating material having areas of elastomeric material extending between the sides thereof, said spacer being positioned in overlying relationship to said printed circuit board with one of said areas of elastomeric material being in juxtaposition to one each of the electrical terminals thereon, said elastomeric material having conductive particles distributed therethrough to form an electrically conductive path from one side of said connecting link to the other when the elastomeric material therein is compressed;

g. a second printed circuit board having components mounted on one side thereof and a plurality of terminals in electrical connection with the components on the opposite side thereof, said second printed circuit board being positioned in overlying relationship to said connecting link with the terminals thereon positioned in juxtaposition to predetermined ones of the elastomeric areas therein; and

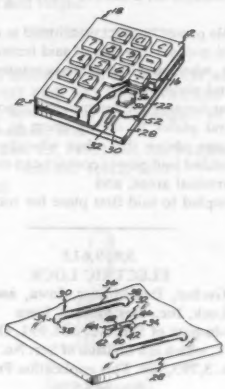
h. mounting means positioned in contact with said second printed circuit board and engaged with said housing for compressing the assembly together until electrical connections are made between the terminals on the first and the second printed circuit boards through the elastomeric areas in the connecting link.

3,959,611

PUSHBUTTON KEYBOARD SYSTEM HAVING PLURAL LEVEL WIRE-LIKE CONTACT

Herbert R. Greene, Providence, R.I., and Charles W. Balser, Attleboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 10, 1975, Ser. No. 535,921
Int. Cl.² H01H 13/70, 1/06
U.S. Cl. 200—5 A 5 Claims



3. A selectively energizable keyboard system comprising an electrically insulating support member having a first surface on which a plurality of conductive paths are arranged in a preselected pattern adapted to transmit electrical information in response to selective interconnection of portions of said paths, conductive support means arranged in a preselected pattern at a second opposite surface of said insulating support member in electrical communication with first preselected portions of said paths, a plurality of conductive contact staple members each having a central body portion disposed at said second surface of said support member in electrically isolated relationship with respect to said conductive support means and each having a pair of legs extending through said insulating support member to be disposed in electrical communication with second preselected portions of said paths, said body portion of each of said contact members having flat portions at a selected level adjacent said legs and having a central part between said flat portions upstanding from said flat portions, and a plurality of selectively actuatable conductive elements adjacent said second surface of said insulating support member, said element being supported by and maintained in continuous electrical contact with said conductive support means and in selected spaced relation to said respective conductive contact members, said conductive elements being adapted to be selectively deflected into engagement with said upstanding central part of said conductive contact member so as to establish an electrical connection between said first and said second preselected portions of said paths in response to the the application of a preselected deflecting force to said conductive element.

3,959,612

ROTARY SWITCH ASSEMBLY PARTICULARLY ADAPTED FOR USE WITH FIBER OPTIC LIGHT SOURCES

Richard E. Feinbloom, New York, N.Y., assignor to Designs for Vision, Inc., New York, N.Y.

Filed Sept. 25, 1974, Ser. No. 509,000

Int. Cl.² H01H *19/58, 21/78;* **H01R** *19/50;* **F21V** *23/04*

U.S. Cl. 200—11 R **10 Claims**

1. A rotary switch particularly adapted for use with an operating room light source, comprising:

a. a first rotatable plate fabricated from an insulating material and having a plurality of lamp accommodating socket recesses located on a first surface thereof,

b. at least on wire accommodating aperture located in each of said recesses coacting with an associated terminal area for each of said apertures, said terminal area positioned on the opposite surface of said first plate,

c. a second plate positioned above said first plate and stationary with respect thereto, said second plate having an aperture located on a surface thereof closest to said first plate,

d. a moveable power contact positioned in said aperture and adapted to contact any one of said terminal areas on said first plate, when said first plate is rotated with respect to said second plate,

e. an annular housing for surrounding a portion of said first and second plates to secure them in a predetermined position one above the other whereby when said first plate is rotated said power contact can coact with any one of said terminal areas, and

f. means coupled to said first plate for rotating the same.

3,959,613

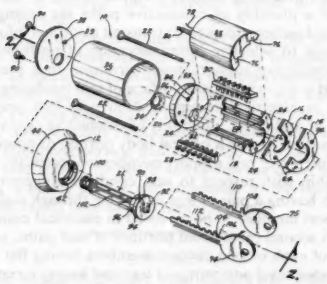
ELECTRIC LOCK

Richard W. Gerber, Des Moines, Iowa, assignor to Gerber Electronic Lock, Inc., Des Moines, Iowa

Continuation-in-part of Ser. No. 401,991, Oct. 1, 1973, Pat. No. 3,873,891, which is a division of Ser. No. 214,675, Jan. 3, 1972, Pat. No. 3,793,500. This application Feb. 10, 1975, Ser. No. 548,528

Int. Cl.² B60N *25/04*

U.S. Cl. 200—44 **20 Claims**



1. A lock actuating mechanism comprising:

a housing having outer walls defining a chamber;

a key having a predetermined pattern of protrusions thereon;

a key receiving member having a keyway therein adapted to receive said key, said receiving member being movably mounted within said housing for moving said key between first and second positions within said chamber;

a set of unlock contacts positioned within said housing to be engaged by said protrusions of said key whenever said key is in said second position;

a set of alarm contacts being between said key and said unlock set of contacts whenever said key is in said first position;

said alarm set of contacts being positioned within said housing in a predetermined pattern related to said unlock set of contacts in such a manner that only a key having the same predetermined pattern of protrusions as said key will move from said first position to said second position without engaging at least one of said alarm set of contacts;

a first electrical circuit connected to said unlock set of contacts;

a second electrical circuit including an alarm therein connected to said alarm set of contacts; and

a timing mechanism in said first circuit and connected to said alarm, said timing mechanism being actuated by connection of one of said unlock contacts to ground and being adapted to actuate said alarm in said second circuit whenever said predetermined number of said unlock contacts are not grounded within a predetermined interval of time after one of said unlock contacts are grounded.

3,959,614

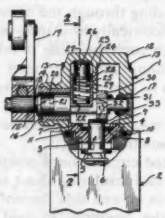
LIMIT SWITCH ROTARY RETURN MECHANISM

Frank J. Graninger, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Oct. 7, 1974, Ser. No. 512,237

Int. Cl.³ H01H *19/18*

U.S. Cl. 200—47 **10 Claims**



1. In a switch actuating mechanism having a linearly movable switch actuator for operating associated switch contacts, a switch spring operating against said linearly movable switch actuator, a rotary camshaft having an engagement with said linearly movable switch actuator to impart linear motion thereto in response to rotation of the camshaft, such camshaft having a flat against which a return spring force operates to center the camshaft in a neutral position, the combination of means including:

a major return spring having a relatively large spring force acting upon said camshaft flat urging said camshaft to said neutral position upon compression thereof;

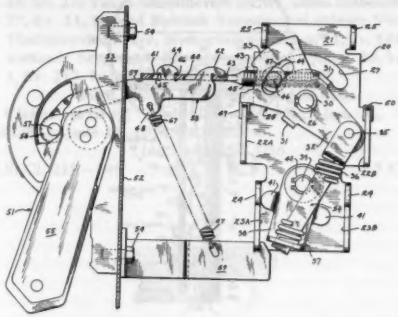
a minor return spring having a relatively small spring force acting serially with said major return spring upon said camshaft flat also urging said camshaft to said neutral position upon compression thereof; and

stop means limiting compression of said minor return spring upon rotation of said camshaft away from said neutral position.

3,959,615
TRIP MECHANISM FOR DISCONNECT SWITCH

Albert A. Zaffrann, Jr., Milwaukee; Robert E. Borchardt, Brown Deer, and Frank A. Grabarczyk, Milwaukee, all of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Jan. 10, 1975, Ser. No. 540,119
Int. Cl.² H01H 31/00
U.S. Cl. 200—153 H 12 Claims



1. A trip mechanism for rotating the crossbar on a disconnect switch, the combination comprising:

a frame having mounting elements which securely fasten the frame to the disconnect switch;

a drive plate mounted to the frame for rotation about a first axis;

a spring support link having one end pivotally connected to an operating end on said drive plate and a second end connected to the frame for rotation about a second axis which is parallel to said first axis, said first and second axis defining a plane of symmetry;

stop means for limiting the rotational motion of said drive plate between first and second positions and positioned such that the operating end on said drive plate swings through said plane of symmetry and equidistantly to either side thereof when the drive plate rotates between said first and second positions;

a trip spring mounted to said spring support link to provide a bias force which thrusts said drive plate into either of its first or second positions;

a connecting arm coupled to a manually operable handle and pivotally connected to said drive plate to rotate it between its first and second positions when said handle is operated, said pivotal connection being at a point on said drive plate which swings through said plane of symmetry and equidistantly to either side thereof when the drive plate rotates between its first and second positions; and

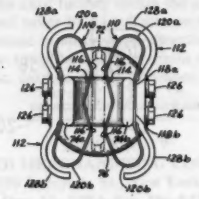
means for coupling the rotation of said drive plate to the crossbar on said disconnect switch.

3,959,616
SPRING CONTACT ASSEMBLY FOR AN ELECTRICAL SWITCH

Howard E. Swanson, Chicago, and William R. Rueth, Jr., Hazel Crest, both of Ill., assignors to G & W Electric Specialty Company, Blue Island, Ill.

Filed Aug. 23, 1974, Ser. No. 499,832
Int. Cl.² H01H 1/42
U.S. Cl. 200—254 13 Claims

1. A contact arrangement for use in an electrical switch and the like, comprising, in combination, a support member having a pair of spaced support arms, an electrically conductive spring contact member supported on each of said support arms to define a pair of opposed spring contact members, each spring contact member having a generally corrugated contact surface defining at least two projecting ridges, each spring contact member further having opposite ends looped to extend toward each other rearwardly of said corrugated contact surface, said opposite ends of each spring contact member being secured to their associated support arm such that said

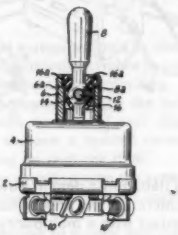


corrugated contact surfaces are in opposed relation to each other with said ridges being adapted to engage a contact bar along lines of contact when said contact bar is brought into engagement with said ridges.

3,959,617
CONDUCTIVE LUBRICANT IN SWITCH ACTUATOR PIVOT FOR RFI ELIMINATION

Harold W. Hults, New Berlin, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Jan. 15, 1975, Ser. No. 541,094
Int. Cl.² H01H 9/06
U.S. Cl. 200—305 5 Claims



1. An electric switch comprising:

a switch housing at least partly of metal having an opening therein and normally being grounded in use;

a metal switch actuator extending out through said opening so as to be accessible for operation to actuate the switch;

a metal mounting member engaging said actuator and secured to said metal part of said housing for supporting said actuator for operation;

and electrically conductive lubricant between said actuator and said mounting member insuring a good electrical connection of said actuator to said housing to prevent RFI radiation therefrom.

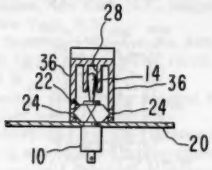
3,959,618
SWITCH ACTUATOR ROCKER HANDLE

Thomas D. Carroll, San Jose, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Filed Nov. 25, 1974, Ser. No. 526,782
Int. Cl.² H01H 3/20
U.S. Cl. 200—339 6 Claims

1. An improved rocker arm operating mechanism for a switch of the type having an actuator movable between a first position and a second position for operating the switch and the switch being mounted on a panel, wherein the improvement comprises a nut having a pair of opposed, projecting pivot points, means for mounting the nut on the panel, and a rocker

arm having a pair of opposed, resilient, centrally located side tabs rotatably gripping the pivot points of the nut so that the



rocker arm is pivotable about the nut and engages with and operates the switch actuator.

3,959,619

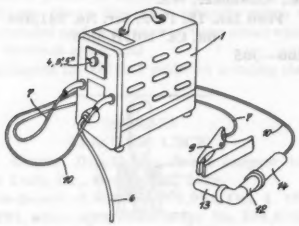
METHOD OF DRAWING-IN OR FLATTENING DENTS IN SHEET METAL

Erwin Schill, Poststrasse 196, 8957 Spreitenbach, Switzerland

Filed Mar. 27, 1974, Ser. No. 455,322

Int. Cl.[2] H05B *3/00*

U.S. Cl. 219—50 **1 Claim**



1. A method of flattening a dent in a metal sheet comprising successively hammering a live copper hammer electrode into instantaneous contact with a multiplicity of locations spaced apart over said dent by striking and impacting the dent with the electrode, passing an electric current through the metal sheet upon impact of the electrode therewith, thereby electrically heating said sheet locally at said locations to relieve stresses in said sheet at said dent, relaxing the sheet and drawing out said dent, and connecting said sheet to a ground electrode prior to bringing said live electrode into contact therewith.

3,959,620

ELECTRIC BARBECUE GRILL

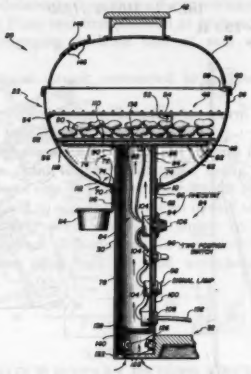
George A. Stephen, Jr., 504 W. Sunset, Mount Prospect, Ill. 60635

Filed Nov. 7, 1973, Ser. No. 413,666

Int. Cl.[2] H05B *1/02*; A47J *37/00*

U.S. Cl. 219—386 **11 Claims**

1. An electric barbecue arrangement comprising: cooking vessel means with food support means associated therewith and having an open top defined by an outer lip and a generally centrally disposed portion inwardly of said lip; housing means, including a hollow member connected to said cooking vessel means at said centrally disposed portion; electric heating means, including heating element means mechanically mounted on said hollow member and electrical cord means disposed within said hollow member for protection, said heating element means further including a first, radially inwardly disposed heating element loop for use in a first cooking mode and a second heating element loop disposed radially outwardly of said first heating element loop for use in a second cooking mode; grill work means mounted in said vessel means for supporting a refractory bed adjacent and in heat exchange relationship with said heating element means; and electrical control means for said heating element means disposed in said



hollow member to be thermally protected from heat emanating from said heating element means and said refractory bed, said control means including means for selectively energizing the first and second heating element loops whereby to accomplish cooking by either the first or second mode.

3,959,621

THERMALLY SENSITIVE SWITCH DEVICE

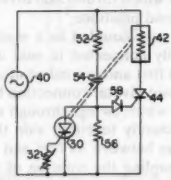
Josuke Nakata, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 16, 1974, Ser. No. 506,050

Claims priority, application Japan, Sept. 26, 1973, 48-108114; Sept. 26, 1973, 48-108115; Nov. 9, 1973, 48-126448; Nov. 15, 1973, 48-128846

Int. Cl.[2] H05B *1/02*

U.S. Cl. 219—501 **12 Claims**



1. A thermally sensitive switch device comprising a main thyristor including a cathode electrode, an anode electrode and a gate electrode, a source of electric power and a load connected in series, said cathode electrode and said anode electrode being connected across the source of electric power and the load, and a thermally sensitive thyristor including a cathode electrode, an anode electrode and a gate electrode, said cathode and said anode electrodes of said thermally sensitive thyristor being connected between a selected one of said cathode and anode electrodes of said main thyristor and said gate electrode of the latter, said thermally sensitive thyristor being brought into its conducting state at a junction temperature thereof in excess of a predetermined magnitude, said main thyristor performing the operation of switching the load under control of the conduction of said thermally sensitive thyristor.

3,959,622
FLEXIBLE ELECTRIC HEATER ELEMENT

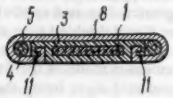
Alexei Alexeevich Bogdanov, Prazhskaya ulitsa, 9, korpus 2, kv. 35; Zakhar Izrailevich Fonarev, prospekt Gagarina, 25, kv. 32; Viktor Petrovich Khorkov, prospekt Slavy, 23, kv. 209, all of Leningrad; Adolf Moritsovich Alexandrov, Federativny prospekt, 6, korpus 3, kv. 8, Moscow; Ninel Rafailovna Iosilevich, prospekt Shaumiana, 54, kv. 27, Leningrad; Vyacheslav Vladimirovich Shitov, ulitsa, Vedeneeva, 14, kv. 23; Yakov Shamilievich Darier, ulitsa Inzhenernaya, 37, kv. 11, both of Rybinsk Yaroslavskoi oblasti; Vsevolod Vladimirovich Peller, Michurinskaya ulitsa, 11, kv. 134, and Alexandr Sergeevich Kostygov, prospekt Slavy, 30, korpus 1, kv. 217, both of Leningrad, all of U.S.S.R.

Filed Jan. 3, 1975, Ser. No. 538,416

Claims priority, application U.S.S.R., Jan. 4, 1974, 1984017; June 17, 1974, 2034573

Int. Cl.² H05B *3/56*

U.S. Cl. 219—549 **7 Claims**



1. A flexible electric heater element in the form of a band, comprising:
   - a plurality of heating wires;
   - an electrically insulating base in which said heating wires are embedded;
   - a sealed envelope enclosing said electrically insulating base, said envelope having opposite pairs of wide and narrow sides,
   - at least one current-carrying wire extending outside said sealed envelope along a corresponding narrow side of said sealed envelope; and
   - means securing said current-carrying wire to said sealed envelope.

3,959,623
CARD CASSETTE

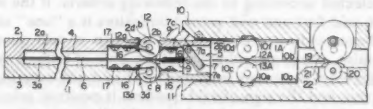
Kunihiko Nakahara, Shiojiri, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Japan

Filed Mar. 4, 1974, Ser. No. 447,634

Claims priority, application Japan, Mar. 8, 1973, 48-29003; Oct. 18, 1973, 48-120333; Aug. 17, 1973, 48-96647; Apr. 10, 1973, 48-42985; Nov. 28, 1973, 48-136155

Int. Cl.² G11B *15/29;* **G06K** *7/08*

U.S. Cl. 235—61.11 R **19 Claims**



1. A card cassette for use with a cassette mount having an interior wall enclosing a cassette receiving chamber, comprising a case having interior walls defining a card containing chamber for containing a card that is to be used to record information and to play back information therefrom, a card access opening communicating with said card containing chamber, said walls having a feed roller mounting slot, a feed roller rotatably mounted on said walls and extending within the feed roller mounting slot, bias means urging the card feed roller in an outward direction away from any card within the card receiving chamber into a position at which at least a part of its periphery projects through the slot and exteriorly of said cassette, said feed roller being brought into abutment against the interior walls of the cassette mount when introduced therein to be forced inwardly against said bias means into engagement with the card within said card containing chamber, said feed roller being rollable on the interior walls of the cassette mount as the cassette is further inserted therein to rotate the said feed roller in a forward feed direction and thereby deliver the card further within the cassette receiving chamber, said feed roller being rollable on the interior walls of the cassette mount in an opposite direction when the cassette is withdrawn from the cassette mount to thereby return the card into the card-receiving chamber of said cassette mount.

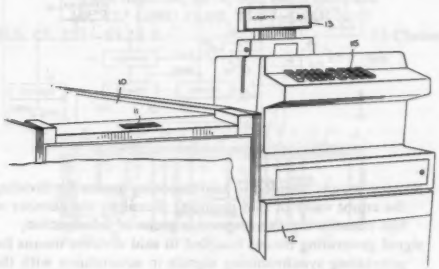
3,959,624
CODED MERCHANDISING COUPON

Walter Kaslow, 380 Lafayette St., New York, N.Y. 10003

Filed Dec. 13, 1974, Ser. No. 532,586

Int. Cl.² G06K *7/14, 19/06, 15/02*

U.S. Cl. 235—61.11 E **4 Claims**



1. In a supermarket system adapted to check-out consumer items, each bearing a distinctive symbol based on the universal product code, the combination comprising:
   - A a merchandise coupon entitling the holder thereof to a specified discount on one of said items, said coupon having printed thereon a symbol corresponding to the symbol appearing on said one item;
   - B an optical scanning unit to scan the symbols on said items and on said coupon to produce signal representative thereof, and
   - C a terminal responsive to signals derived from scanning a group of said items selected by the holder and including means to retrieve the name and price of each item in the group of selected items and to produce an output record in which these items and their prices are identified, said computer further including a memory to store the signals derived from the symbols borne by the items in said group, said terminal being thereafter responsive to a signal derived from scanning said coupon and having means to compare the coupon signal with the stored signal to accord to said holder on said record the benefit of said specified discount only if the coupon signal matches one of the stored signals in the group of items.

3,959,625
CODED INFORMATION-READING DEVICE

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1974, Ser. No. 535,695

Claims priority, application Japan, Dec. 26, 1973, 48-144074; May 13, 1974, 49-52266

Int. Cl.² G06K *7/10*

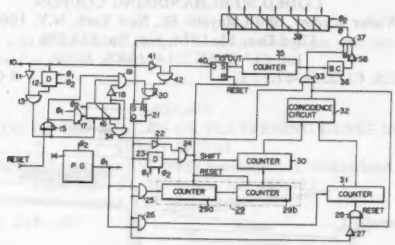
U.S. Cl. 235—61.11 E **7 Claims**

1. A bar-coded information reading device comprising:
   - reading means for reading a number of pieces of coded information serially recorded on a recording medium, each piece of information including the same number of bits and having two synchronizing bits added thereto, one synchronizing bit being arranged immediately before, and

the other synchronizing bit being arranged immediately after a respective piece of information, all of said bits being arranged at equal intervals on the recording medium;

pulse generating means for generating pulses of a constant frequency;

counting means coupled to said pulse generating means for counting the pulses generated by said pulse generating means during the period between the reading of the synchronizing bit arranged immediately before each piece of information and the reading of the synchronizing bit arranged immediately after the respective piece of information;



division means coupled to said counting means for dividing the count value of said counting means by the number of bits constituting the respective piece of information;

signal generating means coupled to said division means for generating synchronizing signals in accordance with the quotient obtained by said division means; and

means coupled to said generating means and to said reading means for causing said reading means to read the bits of each piece of information one-by-one every time said signal generating means generates one synchronizing signal.

3,959,626

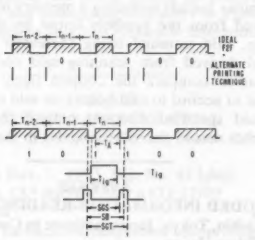
DISTORTED TWO FREQUENCY CODED DATA INTERPRETING METHOD AND APPARATUS

Albert Watson Vinal, Cary, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,852

Int. Cl.[2] G06K 7/00

U.S. Cl. 235—61.11 R **20 Claims**



1. In an **F2F** coded data decoder apparatus system, in which the time periods or widths between signal transitions corresponding to the two frequencies originally used to encode the data may be distorted by spread, when received at said decoder, so as to exhibit their signal transition points spaced at other than the original frequency transition spacing or times, a method of operating said decoder apparatus for interpreting said distorted **F2F** coded data to extract therefrom its correct digital content whenever each multibit data block is preceded by at least a binary 1 preamble or first symbol having two double frequency time slots, or nominal half-symbol widths, by predicting and controlling the duration of a period of inhibiting by said decoding apparatus any single frequency signal transitions occurring at symbol boundary transitions, thereby isolating said double frequency transitions for interpretation, comprising the steps performed by means in said apparatus of:

a. measuring the width of either of the two time slots in said first symbol;

b. measuring the width of said first symbol and, after said measurement is completed, initiating a signal inhibiting time period and reinitiating steps (a) and (b) for the next succeeding symbol;

c. setting a first and a second indicator to a binary 1 state and an odd-even indicator to the "even" state;

d. doubling the measurement made of said time slot;

e. examining the state of said first indicator and, if it is in the binary 1 state, dividing the difference between said doubled time slot measurement and said symbol width measurement by said symbol width measurement;

f. assigning an algebraic sign to the quotient resulting from step (e), said sign being positive if said doubled time slot measurement is greater than said symbol width measurement and negative if said doubled time slot measurement is less than said symbol width measurement when said time slot measurement is made of the first time time slot in said symbol, and said signs being the opposite when said time slot measurement is made of the second time slot of said symbol;

g. selecting an algorithm and predicting an ideal length for said signal inhibiting time period, said algorithm being selected from the following:

$$T_{ip} = T_{n-1}\left[(1\pm\alpha) - \frac{|K_p|}{4}\right], \quad \text{(a)}$$

$$T_{ip} = T_{n-1}\left[(1\pm\alpha) + \frac{|K_p|}{4}\right], \quad \text{(b)}$$

$$T_{ip} = T_{n-1}\left[\frac{2(1\pm\alpha) - \frac{|K_p|}{2}}{2+|K_p|}\right], \text{ or} \quad \text{(c)}$$

$$T_{ip} = T_{n-1}\left[\frac{2(1\pm\alpha) + \frac{|K_p|}{2}}{2-|K_p|}\right] \quad \text{(d)}$$

where α is a variable coefficient arbitrarily chosen from the range $K_{p/4}$ to $\frac{1}{2}$-$K_{p/4}$ and being optimum at $\alpha = \frac{1}{4}$, T_{ip} is the predicted ideal length for said signal inhibiting time, T_{n-1} is the last said symbol width measurement and K_p is the absolute value of said quotient, and said algorithm (a), (b), (c), or (d) is selected according to the following criteria: if the state of both said first and said second indicators is a "one" and said odd-even indicator is even, and the sign of said quotient is negative, select algorithm (a); if the state of both of said first and second indicators is a "one" and said odd-even indicator is even, and the sign of said quotient is positive, select algorithm (b); if the state of said second indicator is a "one" and the state of said first indicator is a "zero" and said odd-even indicator is odd, and the sign of said quotient is positive, select algorithm (c); if the state of said second indicator is a "one " and the state of said first indicator is a "zero" and said odd-even indicator is odd, and the sign of said quotient is negative, select algorithm (d); if the state of both said second indicator and said first indicator is a "zero" and the state of said odd-even indicator is odd and the sign of said quotient is positive, select algorithm (c); if the state of both said second indicator and said first indicator is a "zero" and the state of said odd-even indicator is odd and the sign of said quotient is negative, select algorithm (d); if the state of both said first and second indicators is "zero" and the state of said odd-even indicator is even and the sign of said quotient is positive, select algorithm

(d); if the state of both said first and second indicators is "zero" and the state of said odd-even indicator is even and the sign of said quotient is negative, select algorithm (c); if the state of said second indicator is a "zero" and the state of said first indicator is a "one" and the state of said odd-even indicator is even and the sign of said quotient is positive, select algorithm (b); if the state of said second indicator is a "zero" and the state of said first indicator is a "one" and the state of said odd-even indicator is even and the sign of said quotient is negative, select algorithm (a);

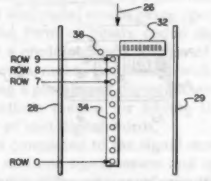
h replacing the state of said second indicator with the state of said first indicator;

i terminating said signal inhibiting time period when it is equal to the predicted ideal length resulting from the use of said selected algorithm and, following the termination of said signal inhibiting period, sensing the next double frequency transition signal, if any, and if such a double frequency transition signal is sensed, setting said first indicator to a binary 1 and entering a one into a data register, and at the predicted reinitiated time resulting from the use of said algorithm, reinitiating said reinitiated symbol width measurement at the symbol boundary signal next occurring, and reinitiating said symbol width and time slot measurements for the succeeding symbol, and setting said odd-even indicator to the even state, and resuming operation at step (d), but if no said double frequency transition signal is sensed, entering a "zero" into said data register, setting said first indicator to a binary 0, setting said odd-even indicator to the opposite state to that it is then in, and terminating said reinitiated symbol width measurement at the symbol boundary signal next occurring, and also reinitiating steps (a) and (b), and reinitiating said signal inhibiting time period at the predicted time resulting from the use of said algorithm, and resuming operation with step (g).

3,959,627
CARD READER

Edward Sonier, Salem, Mass., assignor to Incoterm Corporation, Natick, Mass.

Filed Mar. 28, 1974, Ser. No. 455,929
Int. Cl.² G06K *7/14, 19/06*
U.S. Cl. 235—61.11 E **3 Claims**



1. Apparatus for reading the information stored on a card in a plurality of information positions forming a data matrix, said matrix having M-rows by N-columns with each information position being characterized by one of two states representing a binary 0 or a binary 1, comprising,

guide means for accepting a manually inserted card and guiding said card in a first direction along a predetermined path, as said card is inserted in said guide means at an arbitrary speed,

a first linear array of M-row data detection elements extending in said first direction and positioned adjacent to said guide means for sensing the leading edge of said card as it is carried along said guide means in said first direction, and wherein the spacing of said row data detection elements is related to the spacing of the rows in said data matrix,

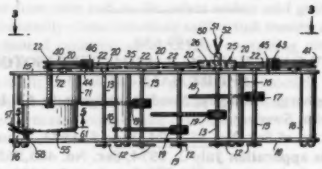
a second linear array of N-column data detection elements perpendicular to said first array and positioned with respect to said guide means so that each of said column data detection elements detects the state of the correspondingly located information positioned in a row of said data matrix on said card as said row passes over said second array,

circuit means coupled to said first and second arrays and providing, as the leading edge of a card passes over each detection element in said first array at said arbitrary speed, that the detection elements of said second array are read out to provide output signals indicating for each column of said data matrix on said card the binary value for each information position in the related row of said data matrix.

3,959,628
ELECTRICAL READ-OUT APPARATUS

Arthur W. Haydon, Middlebury, Conn., assignor to Tri-tech, Inc., Waterbury, Conn.

Filed Sept. 30, 1974, Ser. No. 510,614
Int. Cl.² G08U *19/00, 25/04*; G06R *7/10*
U.S. Cl. 235—61.11 E **13 Claims**



1. Read-out apparatus comprising, in combination:

a plurality of read-out devices responsive to a varying input signal;

a plurality of code elements, one for each of the read-out devices, respectively connected in operative relationship therewith, each of the code elements having a reflective surface containing selected code areas which face away from the corresponding read-out device;

means for operating the read-out devices and the code elements in accordance with said input signal;

light-weight carriage means supported in juxtapositon with the code areas on said elements for movement relative thereto;

only a single sensing device carried by the carriage means in position to produce electrical read-out signals determined by the selected areas of said code elements, and

a drive mechanism for causing the carriage means and the sensing device to move past each of said code elements.

3,959,629
ADJUSTABLE CODING REFLECTOR

Dieter Specht, Dhunn, and Hans vom Stein, Wermelskirchen, both of Germany, assignors to Interrol Fordertechnik GmbH & Co. KG, Dhunn, Germany

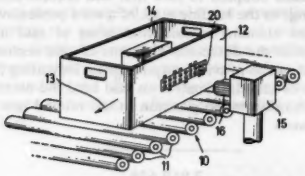
Filed July 12, 1974, Ser. No. 487,868
Claims priority, application Germany, July 17, 1973, 2336246
Int. Cl.² G06K *19/06, 7/14*
U.S. Cl. 235—61.12 N **8 Claims**

1. An adjustable coding reflector for marking objects to be subjected to a photoelectronic target-controlled selection installation, said installation including a scanner, said coding reflector comprising:

a. a base plate having reflector positions constructed as windows therein, with at least one row of reflector positions extending parallel with the direction of movement of the objects;

b. a selective adjustable slide at each individual reflector position having reflectors on the surfaces facing said

scanner for selective adjustment to a reflecting condition by moving said slide in a direction normal to the movement of the objects; and



c. at least one groove disposed on the back of said base plate, one of said slides being disposed in each of said grooves.

3,959,630

IDENTITY CARD HAVING RADIOACTIVE ISOTOPE OF SHORT HALF-LIFE

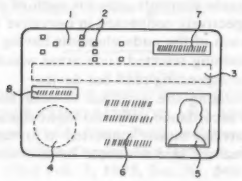
Goran Hogberg, Vallingby, Sweden, assignor to AB Id-Kort, Stockholm, Sweden

Continuation of Ser. No. 367,224, June 5, 1973, abandoned. This application July 3, 1974, Ser. No. 485,565

Claims priority, application Sweden, June 5, 1973, 737368

Int. Cl.² G06K *19/00, 7/08*

U.S. Cl. 235—61.12 N **10 Claims**



1. A method of marking and verifying the validity of an identification card comprising the steps of:

marking a card with a radioactive substance having a comparatively short half-life;

applying to the card information of the initial intensity, I_o, of the radioactive substance, the date of measuring the initial intensity of the radioactive substance applied to the card and information defining the validity period of the card, said validity period being no greater than three times the half-life of the radioactive substance;

measuring the radiation intensity of the radioactive substance on the card, and

comparing the measured intensity with the intensity of the radiation as determined by the formula for radioactive decay

$$I = I_o 2^{-t/t\frac{1}{2}}$$

wherein I = the intensity measured on the occasion of measuring

I_o = the initial intensity

t = the time between the date of determining I_o and I

$t\frac{1}{2}$ = the half-life of the radioactive material,

wherein information parameters for computing the formula are derived from the body of the card.

3,959,631

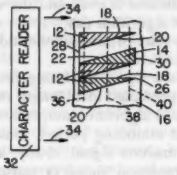
WEDGE CODE AND READING THEREOF

Klaus W. Otten, Xenia, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Aug. 9, 1974, Ser. No. 496,244

Int. Cl.² G06K *7/14, 19/06*; G01N *21/30*

U.S. Cl. 235—61.12 N **12 Claims**



1. A binary data code comprising a plurality of code elements arranged in format to present adjacent areas of discernible portions corresponding to bit characters of data, each of said code elements being triangular shaped and defining widths of increasing or decreasing magnitude along the elements length in relation to a reference line, and means for reading each code element at a plurality of planes along the length thereof for identifying the corresponding bit character by sensing the change is magnitude of the widths of one code element in relation to the widths of an adjacent element.

3,959,632

SERVICE PURCHASING SYSTEM

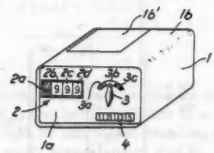
Karl Bengt I:son Trehn, Lillgarden, Overby, 150 12 Stjarnhov, and Nils Henrik Swahn, Granevagen 8, 182 65 Djursholm, both of Sweden

Filed Apr. 29, 1974, Ser. No. 465,329

Claims priority, application Sweden, Apr. 27, 1973, 7359982

Int. Cl.² G06M *1/24, 3/12*

U.S. Cl. 235—92 AC **5 Claims**



1. Service purchasing apparatus comprising

a. a storage device controlled by the purchaser of service and operable to store an indication proportional to a service fee paid by the purchaser of service, said storage device including a first electrical signal decoding means,

b. an information feed device not controlled by said purchaser of services and adapted to have said storage device connected thereto to feed said storage device with information relating to a purchase made,

said information feed device including means for feeding an electrical signal to said first decoding means and second electrical decoding means for receiving and further decoding a signal from said first decoding means,

said storage device further including signal responsive means comprising an electrical circuit having predetermined electrical characteristics for receiving a decoded signal from said second decoding means and providing a predetermined signal to indicate that a predetermined relationship exists between the characteristics of

the received decoded signal and said predetermined electrical characteristics of said circuit,

and means responsive to the provision of said predetermined signal to cause information indicative of the magnitude of a purchase made to be fed to said storage device.

3,959,633

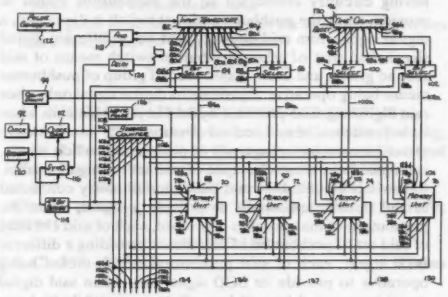
SECURITY GUARD RECORDING SYSTEM

William Grove Lawrence, Santa Ana, and Wolfgang Juergen Sauter, Fountain Valley, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sept. 10, 1974, Ser. No. 504,764

Int. Cl.² G08B *29/00*

U.S. Cl. 235—92 T **19 Claims**



1. A watchman's unit for recording correlated time and station identity information during a watchman's tour, said unit comprising

clock signal means operable, upon connection of the unit to a station, to produce clock signals representative of elapsed time from the start of a tour,

station identity signal means operative, upon connection of the unit to a station, to produce station signals representative of the identity of the station,

clock signal storage means and station signal storage means for storing the signals produced by said clock signal means and said station identity signal means respectively,

at least one of said signal means being operative to produce signals in the form of binary coded digital words each made up of a predetermined number of bits,

the signal storage means associated with said one signal means having a plurality of digital bit storage elements at various locations therein for storing the bit data of a multiplicity of said digital words,

address means connected to the signal storage means associated with said one signal means and operative sequentially to render different one of said digital bit storage elements receptive to applied digital bit data, and

decoder means connected to the output of said one signal means and operative sequentially to transmit different bits of a binary coded digital word signal being produced to its associated signal storage means,

said address means and said decoder means being arranged to be operated in synchronism.

3,959,634

OPERATION COUNTER FOR CABLE ACTUATED MECHANICAL CLUTCHES

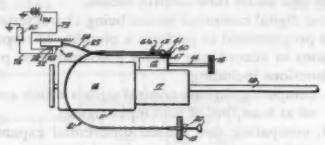
Uville A. Garcia, 1500 SW. 67th Ave., Miami, Fla. 33144

Continuation-in-part of Ser. No. 505,198, Sept. 12, 1974. This application Feb. 21, 1975, Ser. No. 551,524

Int. Cl.² G06M *3/12*

U.S. Cl. 235—92 PD **9 Claims**

1. A mechanical operation counter for use in association with a cable-controlled, lever-actuated power take-off clutch for controlling the operation of a mechanical device, comprising, in combination, a slide wire cable having an outer sleeve member and a control wire coaxially slidable within said sleeve member, an elongated housing structure, a guidance slot in said housing structure and extending longitudinally thereof, a slide bar slidably received for end-to-end movement within said guidance slot, one end of said slide wire cable control wire extending through one end of said housing structure and being secured at an outer end portion thereof to said slide bar for back and forth movement in unison therewith and within said guidance slot, means for securing an outer end



portion of said outer sleeve member of said slide wire cable to one end of said elongated housing member, normally open-circuit electrical switch means controlled by movement of said slide bar from one end to the other within said guidance slot for momentarily close-circuiting said switch means, an electrically actuated counter, an electrical energizing circuit, said electrical switch means being connected in series in said energizing circuit, and means for pivotally connecting the other end of said control wire of said slide wire cable to the lever of the lever actuated power take-off clutch.

3,959,635

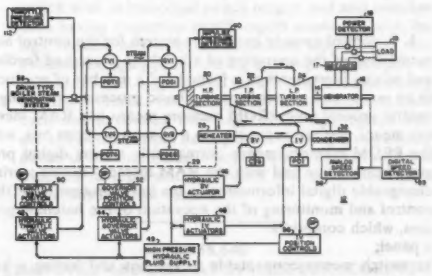
SYSTEM AND METHOD FOR OPERATING A STEAM TURBINE WITH DIGITAL COMPUTER CONTROL HAVING IMPROVED AUTOMATIC STARTUP CONTROL FEATURES

Juan J. Tanco, Buenos Aires, Argentina, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 247,440, April 25, 1972, abandoned, which is a continuation-in-part of Ser. No. 246,900, April 24, 1972, abandoned. This application Apr. 26, 1972, Ser. No. 247,598

Int. Cl.² F01D *19/02*; G05B *15/00*; H02P *9/00*

U.S. Cl. 235—151.1 **34 Claims**



1. An electric power generating system comprising:

a. a steam turbine system;

b. a steam generator for providing steam to said steam turbine system;

c. an electric generator rotated by said turbine system, and adapted to be connected to an electric load;

d. means for digitally computing and processing, having a central processor unit and a memory interconnected with said central processor unit;

e. means for converting input signals to digital data, said input converting means connected to said digital computing means;

f. means for converting digital data to output signals, said digital to output converting means connected to said digital computing means;

g. means for sensing the value of predetermined turbine operating parameters, including differential expansion of predetermined parts of said turbine, and for generating input signals representative of said parameters, said sensing means being connected to said input converting means;

h. means for controlling the steam flow to said turbine;

i. means for connecting said output signal converting means to said steam flow control means;

j. said digital computer means being characterized in that it is programmed to perform a plurality of respective functions in accordance with a predetermined priority, said functions including

i. computing turbine control signals which are a function of at least one of said input signals,

ii. comparing said sensed differential expansion signals with respective predetermined limits,

iii. modifying said computed control signals as a function of said comparison; and

k. said computed control signals being converted to output signals by said output converting means for controlling said steam flow control means as a function of said sensed parameters so as to control steam flow as an intermediate variable, and to control turbine speed during startup and turbine load during load operation as end operating variables.

3,959,636

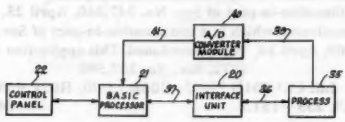
BATCHING SYSTEM

Bernard A. Johnson, Deerfield; Roy W. Klein, Hoffman Estates, and Frederick Philip Gardner, Wonder Lake, all of Ill., assignors to Mangood Corporation, Chicago, Ill.

Filed Mar. 10, 1975, Ser. No. 556,881

Int. Cl.² G01G 19/22; G06F 15/20

U.S. Cl. 235—151.33 **11 Claims**



1. A control console useful in a system for the control and monitoring of the operation of a batching process of feeding and mixing ingredients of a formula of a number of products to be made, said system having a basic processor including a central process unit, PROM memory means and RAM memory means that are connected to a communications bus, with the PROM memory means permanently storing digital program information and with the RAM memory means storing changeable digital information in the basic processor for this control and monitoring of the operation of the batching process, which comprises:

a panel;

keyswitch means connectable to the bus and having a key switch mounted on said panel and turnable between a first position, a second position and an off position, and having circuitry connected to the keyswitch to provide, when the keyswitch is at said first and second positions, from that circuitry different digital signals;

a first group of pushbutton switch means connectable to the bus to provide digital information to be stored in the RAM memory means, said first group including first, second and at least one other pushbutton switch means, each of said first group having a pushbutton switch mounted on said panel and having circuitry connected to the pushbutton switch to provide, when the pushbutton of that switch is depressed, a digital signal from said circuitry that is a different digital signal than that of the other pushbutton switch means of said first group, each of said first group of pushbutton switch means being operative to provide its digital signal only when said digital signal is provided by said key switch means when its keyswitch is at said first position, said second pushbutton switch means being operative to provide said digital signal only when said digital signal is provided by said first pushbutton switch means, and said one other pushbutton switch means being operative to provide its digital signal only when said digital signal is provided by said second pushbutton switch means;

a second group of pushbutton switch means connectable to the bus to provide digital information to be stored in the RAM memory means, said second group including at least a first and a second pushbutton switch means, each of said second group having a switch mounted on said panel and having circuitry connected to the pushbutton switch to provide, when the pushbutton of that switch is depressed, a digital signal from said circuitry that has a different digital signal than that of other pushbutton switch means of said second group, and each of said second group of pushbutton means being operative to provide its digital signal only when said digital signal is provided by said keyswitch means when its keyswitch is at said second position; and

keyboard means including a set of pushbutton switch means, each pushbutton switch means of said set having a pushbutton switch mounted on said panel and circuitry connected to the pushbutton switch to provide a signal, when the pushbutton of that switch is depressed, each of said circuitry of said set of pushbutton switch means providing a different BCD signal, each of said pushbutton switch means being operative to provide its BCD signal only when said digital signal is provided by said keyswitch means while its keyswitch is at said first or second position and said digital signal is provided by any one of said pushbuttons of said first group of pushbutton switch means or one only of said first and second pushbutton switch means of said second group.

3,959,637

DIGITAL FILTER

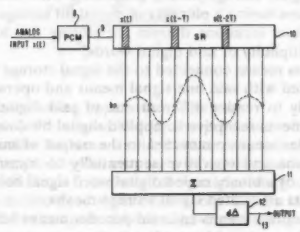
Henri J. Nussbaumer, La Gaude, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 17, 1975, Ser. No. 558,972

Claims priority, application France, June 21, 1974, 74.22172

Int. Cl.³ G06F 1/02, 15/34

U.S. Cl. 235—152 **3 Claims**



1. A digital filter wherein each consecutive sample of an incoming signal is digitally coded with negative amplitudes being coded in a "two-complement" code, said filter including:

a shift register to store the values of the last n samples of said incoming signal;

a source of clock signals to shift said samples through said shift register,

gates on the input of said shift register normally activated by one of said clock signals to feed back the output of said

shift register to the input thereof to recirculate said stored values;

other gates on the input of said shift register activated by the complement of said one of said clock signals to feed the value of a new sample of said input signal to the input of said shift register;

an accumulator to sum up digitally coded values;

a read only storage with each storage address set to represent only a positive or a negative value corresponding to delta coding of the impulse response of said digital filter;

a clock signal driven cyclic addressing means for said read only storage to provide sequential positive or negative value signals;

gates controlled by said sequential positive or negative value signals to pass the oldest value stored in said shift register directly or complementally respectively to an input of said accumulator; and

output gates to periodically gate out the accumulated values as a filtered set of output signals.

3,959,638

HIGHLY AVAILABLE COMPUTER SYSTEM

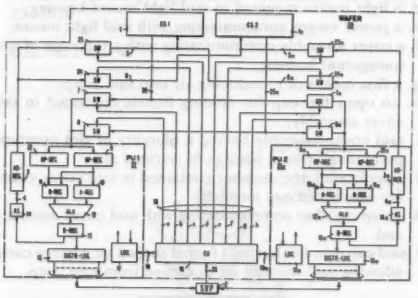
Arnold Blum, Pforzheim; Fritz Irro, and Guenther Sonntag, both of Boeblingen, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 6, 1975, Ser. No. 547,672

Claims priority, application Germany, Feb. 15, 1974, 2407241

Int. Cl.² G06F *11/00, 15/16*

U.S. Cl. 235—153 AK **7 Claims**



1. In a modular computer system including a plurality of individual processors, each having essentially the same structure and functional characteristics but capable of operating under different control programs, wherein each processor has its own instruction processing means, an arithmetic logic unit, storage means, and necessary address and data **1/0** registers the improvement which comprises

error detecting means for indicating that any processor has a hard failure and means for transmitting a failure signal to a control means,

bussing means including gating operable under control of said control means for selectively interconnecting the address and data registers of the storage means of each processor so that any processor may be functionally substituted for the storage means of its own or any other processor in the system;

control means operative in response to a failure indicating signal from said error detection means to stop operation of the defective processor, interrupt the operation of a predetermined one of the non-defective processors and reconfigure said bussing means to connect the storage means of the defective processor to said predetermined non-defective processor and concurrently disconnect the storage means of the predetermined nondefective processor from said processor.

3,959,639

CALCULATING UNIT FOR SERIAL MULTIPLICATION INCLUDING A SHIFT REGISTER AND CHANGE-OVER SWITCHING CONTROLLING THE TRANSMISSION OF THE MULTIPLICAND BITS TO FORM THE PRODUCT

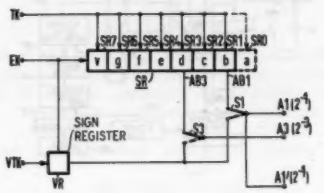
Wolfgang Köethmann, Feldafing, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 12, 1974, Ser. No. 505,495

Claims priority, application Germany, Sept. 13, 1973, 2346188

Int. Cl.² G06F *7/52*

U.S. Cl. 235—164 **18 Claims**



1. A calculating unit for the serial multiplication of a binary multiplicand and a binary multiplier, comprising

a calculating unit input for receiving a binary multiplicand having a number of digits N including a sign digit in serial fashion,

a sign register for storing the sign digit of the multiplicand,

a shift register connected with the calculating unit input and having a series of storage cells into which the multiplicand is fed in serial fashion in response to a series of calculating pulses of a multiplication cycle,

said shift register having tappings each representing a respective binary one multiplier digit of the multiplier and being connected with outputs of respective storage cells of said series in accordance with the digit value of the binary one multiplier digit represented thereby such that the tappings representing successively lower value digits of the multiplier are associated with storage cells which represent successively higher value multiplicand digits,

each of said tappings having an individual changeover switch with an individual switch output, and said switches each having respective switch inputs connected with the sign register and with the associated tapping and said switches being operable during a multiplication cycle to connect the kth tapping with the kth switch output during the first *N* minus *k* calculating pulses of the multiplication cycle and to connect the output of the sign register with the kth switch output during the remaining k calculating pulses of the multiplication cycle where the kth switch is assigned to represent the binary one of the multiplier which has the digit value 2^{-k}.

3,959,640

COMPUTER AND DISPLAY SYSTEM FOR SCORING ATHLETIC EVENTS

Ronald L. Syria, 4996 Southview, Utica, Mich. 48087

Filed June 23, 1975, Ser. No. 589,717

Int. Cl.² A63B *71/06*; G06F *7/38*

U.S. Cl. 235—151 **20 Claims**

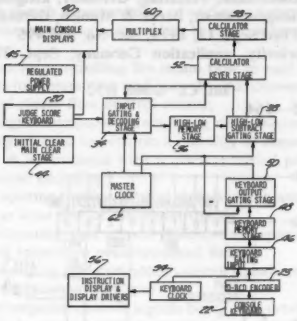
1. A system for computing scores for athletic events, comprising:

multiple data input means for providing a data input representative of each one of a plurality of judges' scores;

second data input means for providing an input representative of weighting factor and degree of difficulty;

means for eliminating the data related to the highest and the lowest of said judges' score;

calculator means for multiplying the combined judges' scores, less the highest and lowest score, by the weighting factor; and



means for displaying the final computed score.

3,959,641

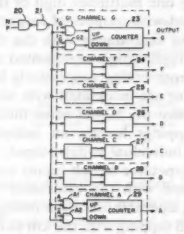
DIGITAL RANGEFINDER CORRELATION

Walter E. Miller, Jr., and Irvin E. Dent, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 5, 1974, Ser. No. 529,973

Int. Cl.² G06F 15/34; G01C 3/08

U.S. Cl. 235—181 **4 Claims**



4. A range finder system for detecting a time related signal in the presence of noise, said system employing digital means for correlating pulses comprising constant false alarm means connected to detect the signal and noise for generating fixed amplitude, fixed width pulses; a correlator comprising first means dividing the length of time a single true signal can occur within into a plurality of equal parts; first through N detecting means connected to said first means and to said false alarm means; said first detecting means being connected to sum up signal and noise occurrences in alternate one-half periods of time and to subtract from this sum the signal and noise occurrences in the remaining periods of time; the second detecting means being connected to sum up the noise and signal occurrences in alternate one-fourth periods of time and subtracting from this the noise and signal returns from the other periods of time; and connecting the third detector means through N detector means in the same manner as above in one-eighth, one-sixteenth . . . $1/N^N$ periods of time respectively whereby the output of said correlator means is indicative of range.

3,959,642

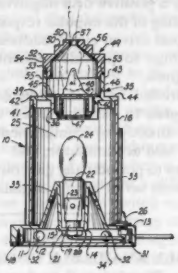
INCENSE LAMP

Jerome C. Turro, Riverdale, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Feb. 6, 1975, Ser. No. 547,721

Int. Cl.² F21V 33/00; A61L 9/02

U.S. Cl. 240—2 LC **7 Claims**



1. An incense lamp, which comprises:

a. a hollow base having a removable bottom face;

b. an upward extending transparent housing affixed to said base;

c. a light means housing communicating with said base and disposed within said transparent housing;

d. a light means mounted in said light means housing;

e. a power means communicating with said light means;

f. a cover assembly communicating with a top edge of said transparent housing;

g. a first means of introducing air into said lamp;

h. an open top cup for holding liquids contained in said cover assembly;

i. said cover assembly having a plurality of slot apertures permitting upward passage of warmed air;

j. a perforated disc member contained in said cover assembly above said cup member;

k. a cap member communicating with said cover assembly; and

l. said cap member having a funnel shaped air passage cavity allowing said warmed air to escape from said lamp.

3,959,643

ANTIBLINDING HEADLAMP FOR VEHICLES

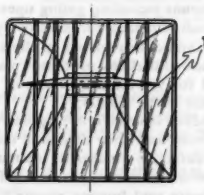
Manuel Mariscal Munoz, Waldstrasse 4, 609 Russelsheim, Germany

Filed July 30, 1974, Ser. No. 493,736

Claims priority, application Spain, Aug. 7, 1973, 193930[U]

Int. Cl.² F21V 7/00

U.S. Cl. 240—41.35 R **2 Claims**



1. An antiblinding headlamp for vehicles, said headlamp comprising:

a straight filament arranged transversally in a horizontal position;

upper and lower reflecting surfaces each being a semi-parabola surface formed by displacing a parabola along a straight line which is tangent to the vertex of said parabola and located in a plane through the focus of said parabola, said upper and lower surfaces being joined at said straight line in a common focal plane thereof and further being cut by three planes which produce, as a projection of the upper reflecting surface on said common focal plane thereof, an isosceles trapeze;

the semi-parabolas of said upper and lower reflecting surfaces having different parabolic values;

the focal axis of said lower reflecting surface being in an advanced position with respect to the focal axis of said upper reflecting surface;

a pair of flat reflecting surfaces connecting the open lateral ends of said joined upper and lower reflecting surfaces; and

a converging lens positioned at the opening formed by the juncture of said flat reflecting surfaces and said upper and lower reflecting surfaces.

3,959,644

APPARATUS FOR ADJUSTABLY POSITIONING AN AIR-COOLED DEVICE

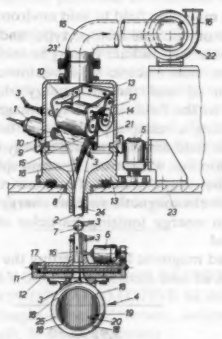
Wilfried Dammel, Nauheim, and Gunter Diessel, Mainz-Lerchenberg, both of Germany, assignors to Feinmechanische Werke Mainz GmbH, Mainz-Mombach, Germany

Filed Oct. 29, 1974, Ser. No. 518,721

Claims priority, application Germany, Oct. 29, 1973, 2354070

Int. Cl.² F21V *29/00*

U.S. Cl. 240—47 **7 Claims**



1. An apparatus for remotely positioning an air-cooled device such as studio flood lights, comprising a housing having a cylindrical guide opening therefrom, at least one winding drum journaled in said housing, a flexible pretensioned elastic tape wrapped on said drum and passing through said cylindrical guide such that the tape is transformed into a rigid air-conducting tube outside of said housing, said air-cooled device secured to the free end of the tube, means for driving said drum to wrap or unwrap said tape thereon for positioning the air-cooled device toward or away from said housing and a fan associated with said housing for passing air through the housing, tube and air cooled device.

3,959,645

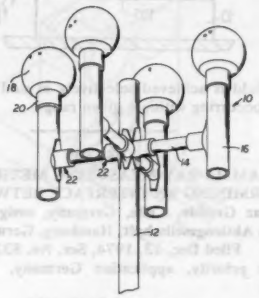
BRACKET AND LAMP GLOBE MOUNTING APPARATUS

Leon R. Patry, 3977 Medina Road, Medina, Ohio 44256

Filed May 28, 1974, Ser. No. 473,874

Int. Cl.² F21S *13/14*

U.S. Cl. 240—84 **2 Claims**



1. A lamp globe support apparatus, or the like, including support members comprising a tubular center support post and an auxiliary tubular support for a lamp globe characterized by

a first bracket including a base and a cup-shaped socket, which bracket is attached to said support post and a second bracket including a base and a cup-shaped socket identical with the first bracket and attached to said auxiliary support, said brackets each having opposed elongated base flanges extending perpendicular to the center axis of its said socket and protruding beyond said socket in opposed aligned relation,

a carrier tube with end portions received in said sockets and extending therebetween, said support members being parallel and vertical, said brackets being positioned to have said cup-shaped sockets facing towards each other and having a common center axis, and

electrical starter and connection means in said carrier tube for connecting to electrical lead means in said support post and said tubular support, said brackets having flat surfaces in opposed marginal base areas thereof at said sockets which surfaces converge inwardly and downwardly of said brackets, said brackets being so shaped and sized that four brackets can be operatively positioned on said support post to have said sockets extend from such support post with the center axes of said sockets being in the same horizontal plane with 90° angles between said brackets, and said flat surfaces of adjacent ones of said brackets are in contact.

3,959,646

AVALANCHE PHOTO-DIODES

Baudouin de Cremoux, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 25, 1974, Ser. No. 526,929

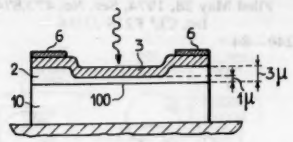
Claims priority, application France, Nov. 28, 1973, 73.42292

Int. Cl.² H01L *27/14*

U.S. Cl. 250—211 J **7 Claims**

1. A heterojunction avalanche photodiode comprising superimposed in succession: a first semiconductor region of a first conductivity type for receiving the radiation which is to be detected and transparent to said radiation, a second, weakly-doped region which is opaque to said radiation, a third region of a second conductivity type opposite to the first conductivity type, and respective contacts on said first and third regions for connecting this contact to a d.c supply in order to reverse-bias said diode, said second region having a

zone in which its thickness is substantially thinner than at the location where said contact is deposited, so that the avalanche



electric field is achieved selectively in said zone at applied voltages occurring within a given range.

3,959,647

GAMMA-RAY MEASURING METHOD FOR DETERMINING AN INTERFACE BETWEEN MEDIA

Karl-Heinz Grodde, Celle, Germany, assignor to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed Dec. 13, 1974, Ser. No. 532,554

Claims priority, application Germany, Dec. 21, 1973, 2363783

Int. Cl.² G01V *5/00*

U.S. Cl. 250—258 **6 Claims**

1. In a method for determining the location of an interface between media, wherein a source of gamma radiation is placed at said interface and its emissions are detected the improvement which comprises

using as said source of gamma radiation a gelled substance containing a source of gamma radiation.

3,959,648

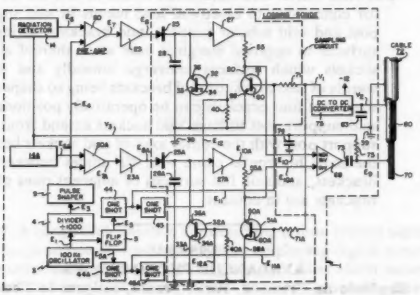
DUAL SPECTRA WELL LOGGING SYSTEM AND METHOD

Robert W. Pitts, Jr., and Houston A. Whatley, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 379,033, July 13, 1973, abandoned. This application Oct. 23, 1974, Ser. No. 517,131

Int. Cl.² G01V *5/00*

U.S. Cl. 250—262 **27 Claims**



1. A well logging method for providing outputs corresponding to at least one condition sensed in a borehole which comprises the following steps of sensing at least one condition in the borehole, providing two data pulse signals corresponding to the sensed condition, providing reference pulses, providing two pulse signals, each pulse signal having data pulses from a corresponding data pulse signal and reference pulses, sampling one pulse signal during first predetermined time intervals, providing output pulses of one polarity corresponding in amplitude to the largest amplitude pulses occuring in the samples of the one pulse signal during second predetermined time intervals, sampling the other pulse signal during that predetermined time interval, providing output pulses of another polarity corresponding in amplitude to the largest amplitude pulses in the samples of the other pulse signal during fourth predetermined time intervals, conducting the output pulses from the borehole, receiving the pulses at the surface, separating the received output pulses in accordance with their polarity, processing pulses of one polarity to provide a first output corresponding to the condition and processing the pulses of the other polarity to provide a second output corresponding to the condition.

3,959,649

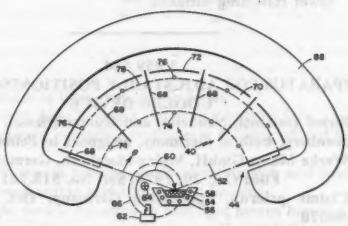
COLLECTION OF IONS IN A PLASMA BY MAGNETIC FIELD ACCELERATION WITH SELECTIVE POLARIZATION

Harold K. Forsen, Bellevue, Wash., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Dec. 27, 1973, Ser. No. 428,661

Int. Cl.² H01J *39/34*

U.S. Cl. 250—299 **24 Claims**



1. For use in a technique of isotope enrichment, a method for separation of particles of one isotope type in an environment of flowing particles of plural isotope types comprising the steps of:

applying a magnetic field to said environment including the particles of said one isotope type; and

applying polarized radiant energy to said environment with the transverse electric field vector of electromagnetic radiation of said radiant energy aligned substantially parallel to the field lines of said magnetic field, thereby establishing a relative polarization between the applied magnetic field and the radiant energy to provide reduced absorption line width from Zeeman splitting for the particles in the magnetic field of said environment in response to the electromagnetic radiant energy;

the radiant energy ionizing particles of said one isotope type; and

said applied magnetic field diverting the flow of the ionized particles of said environment.

3,959,650

METHOD FOR DETECTING AND IDENTIFYING ALLERGY

Herbert R. Lukens, Jr., La Jolla, Calif., assignor to Intelcom Rad Tech, San Diego, Calif.

Filed Aug. 26, 1974, Ser. No. 500,641

Int. Cl.² G01T *1/161*

U.S. Cl. 250—303 **6 Claims**

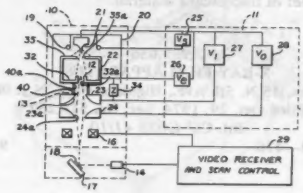
1. A method for determining the presence of an antigen-specific antibody in a vertebrate, comprising, obtaining a sample of effluvial tissue from the vertebrate, providing a specific antigen for the antibody being investigated labeled by means of a moiety, exposing said sample to the specific antigen under conditions such as would allow the formation of a conjugate compound thereof in the presence of the antigen-specific antibody, rinsing the sample to remove excess moiety, and detecting the presence or absence of the conjugate compound by detecting the presence or absence of the moiety.

3,959,651

ELECTRON MICROSCOPE

Leonard M. Welter, Saratoga, Calif., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 24, 1974, Ser. No. 463,629
Int. Cl.² H01J 37/26
U.S. Cl. 250—310 4 Claims



1. A charged particle microprobe system comprising:
a housing defining a vacuum chamber;
a field emission tip disposed in said chamber for generating charged particles;
apertured electrode means disposed in said chamber for establishing a focusing and accelerating electrical field for forming a beam of said charged particles;
means for deflecting said beam in a predetermined raster pattern;
apertured field electrode means disposed in said chamber intermediate said field emission tip and said electrode means for developing an electric field for generating said charged particles, said apertures of said electrode means and field electrode means being axially aligned with said field emission tip;
voltage supply means connected to said electrode means, said field electrode means and said field emission tip for supplying electrical potential to establish said electrical fields; and
a non-magnetic resistive conductor being generally physically and electrically symmetrical about an axis disposed intermediate said field electrode means and said electrode means with its axis generally aligned with the axis of said apertured electrode and in electrical contact therewith, said member being formed of a material having a substantially uniform cross-sectional conductivity and a predetermined value of resistance over its axial extent whereby said resistance conductor provides a leakage resistance path substantially free of eddy currents.

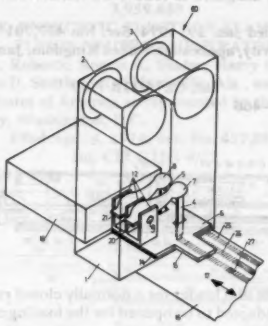
3,959,652

DEVICE FOR RAY DIAGNOSIS FOR DETERMINING THE DISTRIBUTION OF RADIOACTIVE SUBSTANCES

Lothar Heinz, Erlangen-Bruck, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed May 16, 1973, Ser. No. 360,826
Claims priority, application Germany, June 6, 1972, 2227495
Int. Cl.² G01T 1/20
U.S. Cl. 250—363 S 3 Claims

1. A ray diagnosing device, comprising a measuring head with a ray probe, means moving said measuring head for a line by line scanning of a part of a body to determine the distribution of radioactive substances therein, a device for setting the line distance, a printer actuated by the ray probe for printing a representation corresponding to the activity distribution, said printer comprising a plurality of keys, each of said keys corresponding to a specific line spacing, an actuating device operating said keys and comprising a shaft actuated by the ray probe, levers connected with said keys and mounted upon said shaft for longitudinal movement thereon, and a catch carried by said shaft in a printing position and adapted to selectively engage one of said levers, and a setting device moving selectively each key into a printing position in which it is connected



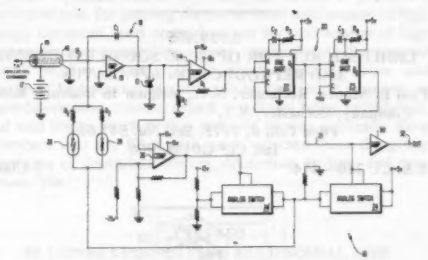
to said actuating device and for selectively switching off each of said keys.

3,959,653

FAST CHARGE DIGITIZER AND DIGITAL DATA ACQUISITION SYSTEM FOR MEASURING TIME VARYING RADIATION FIELDS

Thomas R. Lee, Gaithersburg, Md.; Roger H. Schneider, Washington, D.C., and John L. Wyatt, Berkeley, Calif., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Apr. 14, 1975, Ser. No. 567,719
Int. Cl.² G01T 1/16, 1/18
U.S. Cl. 250—374 10 Claims



4. An apparatus for the measurement of time varying radiation fields comprising:
a radiation detection means for generating an electrical output representative of an amount of radiation to which said detection means is exposed;
a charge digitizer means, electrically connected to said detection means, for generating a train of pulses representative of said amount of radiation;
a sampling and storage means for sampling said train of pulses for a plurality of preset periods of time, determining a sample value for each of said plurality of preset periods of time, and storing a predetermined number of said sample values; and visual display means for simultaneously visually displaying said predetermined number of said sample values in proper chronological order.

3,959,654

DISPENSER FOR SHEET LIKE MATERIAL

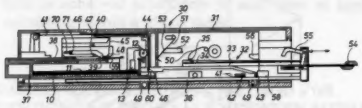
Emile Frans Stievenart, Hoboken; Hugo Frans Deconinck, Deurne-Zuid, and Willy Gabriel Ceuppens, Borgerhout, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Jan. 29, 1974, Ser. No. 437,701

Claims priority, application United Kingdom, Jan. 30, 1973, 4656/73

Int. Cl.² G11B *1/00*

U.S. Cl. 250—468 **8 Claims**



1. A daylight film loader for a normally closed radiographic film cassette adapted to be opened for the loading of fresh film therein, which comprises:
1. a generally light-tight housing,
2. a magazine section in said housing for holding a supply of fresh film to be loaded,
3. a loading section in said housing in generally adjacent relation to said supply section, said loading section being adapted to be opened for the introduction therein of a cassette into opened loading position and be closed when the cassette is in loading position,
4. dispensing means operative in said magazine section to deliver film from said magazine section into said cassette,
5. light shielding means disposed generally between said two housing sections for movement between an operative closed position isolating said magazine section from said loading section and an open position in which the two sections are in communication, and
6. operating means for said shielding means effective in response to the arrival and departure of said cassette to and from its loading position to move said shielding means to and from its operative closed position.

3,959,655

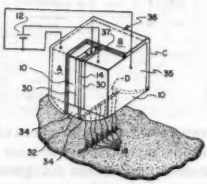
LIGHT SOURCE FOR OPTICAL SOUND RECORDING AND REPRODUCTION APPARATUS

Paul B. Mauer, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 6, 1975, Ser. No. 547,661

Int. Cl.² G01M *5/00*

U.S. Cl. 250—474 **2 Claims**



1. A light source comprising:
a green-light emitting diode having a light emitting face thereon;
a sheet of fluorescent material comprising Rhodamine 6-G dye dispersed in polystyrene, supported adjacent said light emitting face, the plane of said sheet lying substantially parallel to the plane of said light emitting face; and
a sheet of magnesium fluoride disposed between said sheet of fluorescent material and said light emitting face for supporting said sheet of fluorescent material, said sheet of magnesium fuoride being transparent to light emitted from said light emitting face and having an index of refraction lower than the index of refraction of said sheet of fluorescent material,
whereby, light emitted from said light emitting face is absorbed by said fluorescent material and re-emitted from said fluorescent material, a portion of said re-emitted light emerging as a narrow line of light from an edge of said sheet of fluorescent material.

3,959,656

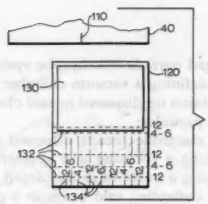
X-RAY FILM APPARATUS

Arnold Peters, 15 N. 5th Ave., Highland Park, N.J. 08904

Filed Oct. 29, 1974, Ser. No. 518,252

Int. Cl.² G03B *41/10*

U.S. Cl. 250—476 **9 Claims**



1. X-ray film exposing apparatus comprising
a plate comprising a frame impervious to X-rays and having an aperture through which X-rays can pass,
means for changing the size of said aperture in accordance with the number of exposures to be made on a sheet of film,
a horizontal and vertical plate guide marker on said frame, each marker being aligned with a line which divides said aperture into portions,
an X-ray film holding tray adapted to be positioned beneath said plate and carrying a plurality of groups of horizontal and groups of vertical film guide markers,
said tray being adapted to carry X-ray sensitive film,
said tray being movable with respect to said plate so that each vertical marker of a group can be separately aligned with said vertical guide marker on said plate, and each horizontal guide marker of a group can be separately aligned with said horizontal guide marker on said plate whereby a plurality of sectors of said film can be positioned in said aperture in said plate to receive X-ray radiation therethrough.

3,959,657

FILM IDENTIFICATION APPARATUS

Seymour Katz, Glen Cove, and Victor R. Brown, West Hempstead, both of N.Y., assignors to IPCO Hospital Supply Corporation, White Plains, N.Y.

Filed Apr. 7, 1975, Ser. No. 565,583

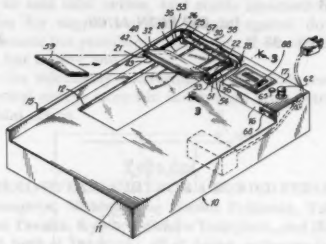
Int. Cl.² G03B *41/16*

U.S. Cl. 250—476 **12 Claims**

1. apparatus for placing identifying indicia on film within a cassette, the apparatus comprising, in combination:
a cassette supporting member for receiving a cassette;
illumination means carried by the supporting member and having a protruding portion in position to extend within an opening of a cassette received by said member;
indicia means disposed on the protruding portion of the illumination means and containing identifying information thereon;
an electrical circuit connected to the illumination means for energizing the same, to illuminate said illumination means

and thereby expose the film within the cassette with the information on the indicia means; and

slide means movably mounted on the cassette supporting member for protecting the protruding portion of the illumination means, the slide means beng engaged by said



cassette and being urged thereby away from protecting relationship with said protruding portion as the cassette is received by said supporting member, such that only the protruding portion and said indicia means extend within said cassette opening.

3,959,658

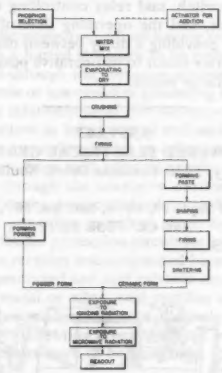
MICROWAVE DOSIMETER UTILIZING THERMOLUMINESCENT MATERIALS

Paul L. Ziemer; Richard J. Vetter, both of West Lafayette, Ind., and Donald R. Elle, Albuquerque, N. Mex., assignors to Purdue Research Foundation, Lafayette, Ind.

Filed June 13, 1974, Ser. No. 478,433

Int. Cl.² H05B *33/00*

U.S. Cl. 250—484 **16 Claims**



1. The process of manufacture of a microwave sensitive material for use as a dosimeter comprised of the steps of:

selection of a chemical phosphor having any of the chemical compositions of: $BaTiO_3$, $SrTiO_3$, or $BaZrO_3$,

the thermoluminescent output of said selected phosphor being known;

exposing said phosphor to a high dose of ionizing radiation sufficient to saturate the electron traps in the crystal lattice of said phosphor;

whereby subsequent exposure to microwave radiation results in a reduction in the number of saturated electron traps so that measurement of the thermoluminescent output of said phosphor may be measured and said reduction in thermoluminescent output is directly related to the quantity of microwave exposure.

3,959,659

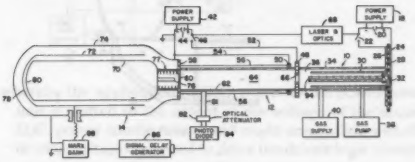
INTENSE, ENERGETIC ELECTRON BEAM ASSISTED FUSION NEUTRON GENERATOR

Thomas G. Roberts; Romas A. Shatas; Harry C. Meyer, III, and John D. Stettler, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 4, 1974, Ser. No. 457,868

Int. Cl.² G21G *4/02*

U.S. Cl. 250—501 **3 Claims**



1. An electron beam assisted fusion neutron generator comprising a plasma generator; a source of high energy electrons; and a beam forming and guiding section interconnecting said source of high energy electrons and said plasma generator; and control means for the plasma generator, the beam forming and guiding section, and the source of high energy electrons for causing neutrons to be produced from interaction of a plasma produced by the plasma generator and electrons from said source of high energy electrons, said beam forming and guiding section being a linear pinch device and said control means for said beam forming and guiding section and said plasma generator including a rechargeable capacitor bank for each of said beam forming and guiding section and said plasma generator, and control means for simultaneously firing each capacitor bank to cause said plasma generator to produce a plasma and said linear pinch device to produce a current sheath for guiding electrons from said source of high energy electrons, said control means for said source of high energy electrons including means responsive to the current sheath produced in said linear pinch device to cause said source of high energy electrons to be emitted in response to a predetermined current sheath condition being established, and said linear pinch device and said plasma generator have chambers that are filled with gases selected from the group consisting of deuterium-tritium, deuterium, tritium, and deuterium ^3He.

3,959,660

IR GENERATOR HAVING ELLIPSOIDAL AND PARABOLOIDAL REFLECTORS

Peter Marvin Tolliver, Brighton, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 295,421, Oct. 6, 1972, Pat. No. 3,784,836. This application Jan. 29, 1973, Ser. No. 327,693

Int. Cl.² G01J *1/00*

U.S. Cl. 250—504 **2 Claims**

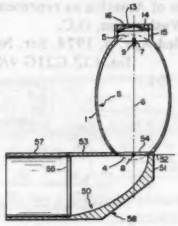
1. In an IR generator, the combination of a first shell having an inner reflective ellipsoidal surface and a second shell having an inner reflective paraboloidal surface;

said shells being secured together with one focus of said ellipsoidal surface being also the focus of said paraboloidal surface, said surfaces also having their respective major and principal axes intersecting each other;

said first shell being adapted for providing a source of radiation at the other focus of said ellipsoidal surface and said shells having openings where they are secured together,

for allowing said radiation to enter said second shell via said one focus;

said paraboloidal surface being a semiparaboloid, and there being a cylindrical tube containing said second shell; said



tube having one of said openings in the side thereof, and said second shell being oriented in said cylinder so that said focus of said paraboloidal surface is at said one of said openings and said principal axis thereof is along the length of said tube.

3,959,661

APPARATUS FOR PURIFYING EXHAUST GASES CONTAINING IONIZABLE AND OXIDIZABLE COMPONENTS

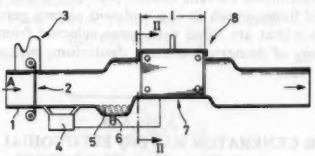
Conrad Sander, Altdorfer Strasse, D 7441 Grossbettlingen, Germany

Filed Dec. 3, 1974, Ser. No. 529,226

Claims priority, application Germany, Dec. 5, 1973, 2360483

Int. Cl.² B01K *1/00*; C01B *13/11*

U.S. Cl. 250—531 **6 Claims**



1. An apparatus for purifying exhaust gases having ionizable and oxidizable gaseous components, comprising:

an exhaust chamber for flowing the exhaust gases therethrough, said exhaust chamber having a portion displaced transversely from the longitudinal axis of said chamber;

a filter mounted across the inside of said exhaust chamber to remove particles from the exhaust gases;

a plurality of spaced, parallel plate-shaped electrodes located in said displaced portion of said exhaust chamber downstream of said filter; and

power means connected to each of said electrodes for providing a rectangularly-shaped AC voltage to alternate said electrodes to ionize and oxidize the gaseous components of the exhaust gases.

3,959,662

ENGINE STARTING SYSTEMS

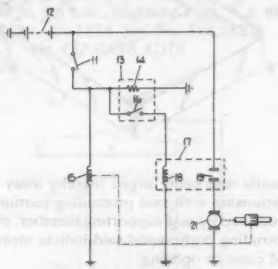
Roger Henry Hartley, Sutton Coldfield, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed June 5, 1974, Ser. No. 476,554

Claims priority, application United Kingdom, July 25, 1973, 35433/73

Int. Cl.² F02N *11/00*

U.S. Cl. 290—38 R **3 Claims**



1. An engine starting system including an electrically operated starter motor having a driven pinion which is movable axially of an output shaft of the starter motor between an operative position and a rest position, a manually operable switch, an electromagnet winding energisation of which is controlled by operation of said manually operable switch, said electromagnet winding when energised causing movement of said pinion from its rest position towards its operative position, a thermally operable snap-action switch including a heater energisation of which is controlled by said manually operable switch, and, a relay energised by way of said thermally operable switch, said relay controlling energisation of the starter motor, and the operating time of the thermally operable switch providing a delay between movement of the pinion of the starter motor to its operative position, and energisation of the starter motor.

3,959,663

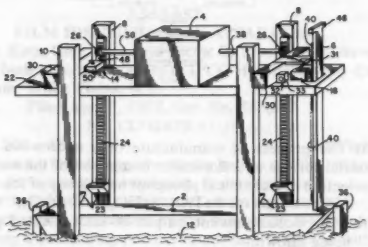
TIDE-POWERED ELECTRICAL GENERATOR

Joseph V. Rusby, 2230 Granada Drive, South Daytona, Fla. 32019

Filed Sept. 19, 1974, Ser. No. 507,289

Int. Cl.² F03B *13/12*

U.S. Cl. 290—53 **10 Claims**



1. A tide-powered electrical generator for use on a body of water subject to tidal action, comprising:

flotation means for responding to a rising tide by vertical translation;

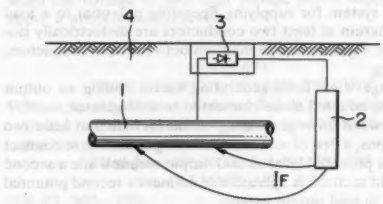
energy storing means comprising a weight;
jack bar means mounted on said flotation means for successively engaging said weight during successive rising tide movements for raising said weight in successive movements, said jack bar means disengaged from said weight during declining tide movements;
means defining a stable structure substantially non-responsive to said tidal action, said stable structure including means for supporting said weight against downward movement but permitting said weight to be raised by said jack bar means; and
means for selectively converting to electrical energy the potential energy stored in said weight after being raised by tidal action.

3,959,664

ANTICORROSIVE CIRCUIT FOR A BURIED STRUCTURE

Eiiti Kosoegawa, Nishinomiya; Kazuo Fujimoto, Takatsuki; Yoshimi Tanaka, Kyoto; Yuichiro Takayama, and Hirotsugu Hattori, both of Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Nov. 7, 1974, Ser. No. 521,570
Claims priority, application Japan, Nov. 12, 1973, 48-127489; Nov. 13, 1973, 48-127514
Int. Cl.² B01D *13/02*
U.S. Cl. 307—95 **8 Claims**



1. In a cathodic protection circuit having no external power supply in which a buried structure to be protected is electrically connected through the corrosive environment to a buried galvanic anode or low-resistive grounding metal or alloy so that, due to the relatively small electromotive force between said buried structure to be protected and said galvanic anode or low-resistive grounding metal or alloy, an anticorrosion current may flow from said galvanic anode or low-resistive metal or alloy through the corrosive environment and said buried structure to be protected back to said galvanic anode or low-resistive grounding metal or alloy, the improvement wherein said cathodic protection circuit for said buried structure comprises a rectifier interconnected between said buried structure to be protected and said galvanic anode or low-resistive grounding metal or alloy, said rectifier capable of conducting anticorrosion current at said relatively low electromotive force and of preventing reverse current which causes the corrosion of said structure to be protected.

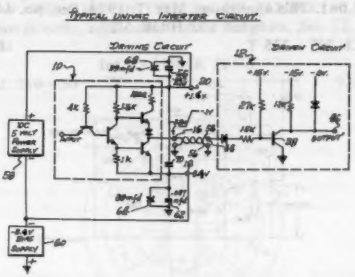
3,959,665

LOGIC CIRCUITS WITH INTERFACING SYSTEM

Jim A. Gilbreath; Robert P. Crabb, both of San Diego, and Robert A. Unger, El Cajon, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 29, 1974, Ser. No. 474,278
Int. Cl.³ H03K *19/08, 19/40*
U.S. Cl. 307—208 **8 Claims**

1. In a driving logic circuit having input and output terminals and first and second power terminals, an interfacing means for making the driving logic circuit compatible with a driven logic circuit comprising:
a first D.C. power source means which is connected across the first and second power terminals; and
a second D.C. power source means connected in opposition to the first D.C. power source means,



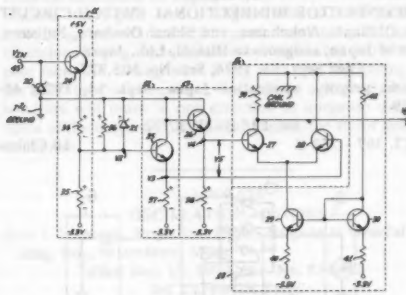
whereby the application of D.C. power to the power terminals is shifted to the extent of the voltage of the second D.C. power source means and made compatible with the driving voltages required to drive the driven logic circuit.

3,959,666

LOGIC LEVEL TRANSLATOR

Darrell L. Fett, Scottsdale, and David A. Bird, Phoenix, both of Ariz., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed July 1, 1974, Ser. No. 484,513
Int. Cl.² H03K *19/08, 5/02, 5/08, 5/156*
U.S. Cl. 307—208 **13 Claims**



1. A logic level translator for translating first signals having a first logic level swing with respect to ground of a first unit to second signals having a second logic level swing with respect to ground of a second unit said translator comprising:
reference potential means for providing reference potential signals;
voltage dividing means coupled to said first unit ground and to said reference voltage means and responsive to said first signals;
a first emitter follower with its input terminal coupled to said first unit ground;
a second emitter follower with its input terminal responsive to signals from said voltage dividing means; and
current switching means having first and second power terminals coupled to said reference potential means and to said second unit ground respectively, said current switching means responsive to the difference between signals generated by said first and said second emitter followers, said current switching means generating output signals.

3,959,667

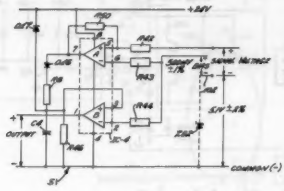
OVERCURRENT TRIP DEVICE

Donald R. Boyd, Waukesha, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Division of Ser. No. 316,372, Dec. 18, 1972, Pat. No. 3,831,061. This application Mar. 7, 1974, Ser. No. 449,194

Int. Cl.[2] H03K 5/20

U.S. Cl. 307—235 T 1 Claim



1. In a signal voltage level sensing circuit;

first means operable to sense the difference between a signal voltage and a predetermined reference voltage;

a memory means operably connected to receive and store the output signal of said first means;

a second means operably connected to said memory means and operable to increase the current and the voltage available from said memory means;

means for controlling a minimum duration of input signal to which said memory means responds; and,

means for preventing the magnitude of the voltages of said memory means from exceeding the power supply voltage when said power supply voltage is decreasing.

3,959,668

SEMICONDUCTOR BIDIRECTIONAL SWITCH CIRCUIT

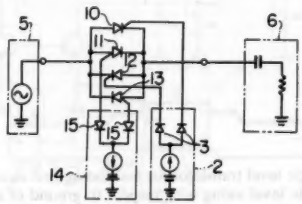
Ichiro Ohhinata, Yokohama, and Shinzi Okuhara, Fujisawa, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 13, 1974, Ser. No. 505,973

Claims priority, application Japan, Sept. 14, 1973, 48-103039

Int. Cl.[2] H03K 17/72

U.S. Cl. 307—252 G 10 Claims



1. A semiconductor bidirectional switch circuit comprising: a bidirectional switch including a couple of thyristor pairs connected in parallel in opposite directions, each of said pairs including a cathode-gate drive thyristor and an anode-gate drive thyristor; first driving circuit means for supplying current to the cathode-gates of said cathode-gate drive thyristors forming said bidirectional switch; and second driving circuit means for taking out current from the anode-gates of said anode-gate drive thyristors forming said bidirectional switch; wherein under any output loading condition of said thyristors, the amplitude of the output voltage of said first driving circuit means may be made low without regard to the amplitude of an A.C. signal voltage to be switched by said thyristors, so as to allow the signal current flowing through said thyristors to remain flowing even when said A.C. signal voltage is reduced below the minimum holding current level of said thyristors.

3,959,669

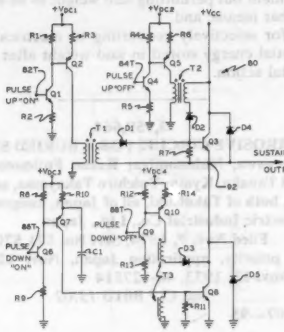
CONTROL APPARATUS FOR SUPPLYING OPERATING POTENTIALS

Edwin F. Peters, Maumee, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 8, 1972, Ser. No. 313,480

Int. Cl.[2] H03K 1/12, 3/30

U.S. Cl. 307—262 12 Claims



1. In a system for supplying operating potential to a load device wherein at least two conductors are dielectrically isolated from a gas discharge medium between said conductors, comprising

a. voltage wave form generating means having an output means adapted to be connected to a conductor;

b. said wave form generating means including at least two sections, a first of said sections being operative to connect a first potential level to said output means while a second of said sections is operative to connect a second potential level to said output means;

c. each of said output sections including at least one output transistor means operating as a switching means between its respective potential level and said output means of said wave form generating means, each said transistor means having collector, base and emitter electrodes and collector-base and emitter-base junctions;

d. means for selectively applying turn-on signals to the emitter base junctions of each of said output transistor means, said signals being sufficient in magnitude to drive each of said output transistor means into saturation;

e. means for selectively applying turn-off signals to each of said output transistor means;

f. means responsive to said turn-off signals for selectively establishing current flow through said collector-base junction of each of said output transistor means to reverse bias said collector-base junction to enable each of said output transistors to turn off quickly; and

g. means for coordinating the application of said turn-on and turn-off signals so that a turn-off signal for one section will overlap in time a turn-on signal for the other section to prevent current spiking of the output transistor means being turned off.

3,959,670

BLASTING MACHINE

James D. Heckelman, Norwalk, Ohio, assignor to Research Energy of Ohio, Inc., Cadiz, Ohio

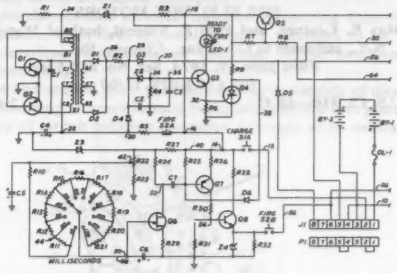
Division of Ser. No. 357,826, May 7, 1973, Pat. No. 3,805,115. This application Jan. 23, 1974, Ser. No. 435,986

Int. Cl.[2] H03K 5/15, 1/02

U.S. Cl. 307—268 18 Claims

1. A blasting machine comprising: a charge storing condenser, a high voltage power supply for charging said condenser, a low voltage power supply, an electric pulse genera-

tor, a first switch means having power terminals supplied with energy from said low voltage power supply and a control terminal which receives a signal from said pulse generator, control means receiving a signal from conduction of said power terminals of said switch means for connecting said condenser to a load, circuit means receiving voltage from said



low voltage power supply and communicating said voltage to the control terminal of said first switch means to bias said first switch means off and prevent said first switch means from responding to said pulse generator, and means preventing said circuit means from supplying said voltage to said switch means when the voltage of said high voltage power supply is at or above a predetermined level.

3,959,671

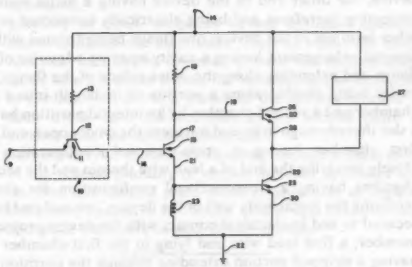
HIGH CURRENT PULSER CIRCUIT

William Stanley Watson, Colonial Beach, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 20, 1975, Ser. No. 588,998

Int. Cl.² H03K *1/00, 3/26*

U.S. Cl. 307—270 **4 Claims**



1. A high current pulser circuit comprising:

means to supply voltage;

an input stage electrically connected to said voltage supplying means;

a first transistor with its base electrode electrically connected to said input stage and with its collector electrode connected to said voltage supplying means;

a second transistor with its base electrode connected to the emitter electrode of said first transistor and with its emitter electrode connected to said voltage supplying means;

an inductor interconnecting the emitter electrode of said first transistor and the emitter electrode of said second transistor;

a load interconnecting said voltage supplying means and the collector electrode of said second transistor; and

means to bleed off voltage connected between said voltage supplying means and the collector electrodes of said first and second transistor.

3,959,672

ELECTRIC MACHINES

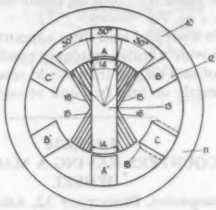
Michael Edward Walker, Redditch, and Peter Timothy Wooding, Sparkhill, both of England, assignors to C.A.V. Limited, Birmingham, England

Filed Jan. 20, 1975, Ser. No. 542,383

Claims priority, application United Kingdom, Jan. 22, 1974, 2929/74

Int. Cl.² H02K *19/06*

U.S. Cl. 310—36 **9 Claims**



1. A variable reluctance electric motor comprising a stator structure and a rotor structure, said rotor structure comprising a pair of interconnected rotor pole pieces defining at their outer ends rotor pole faces, said stator structure comprising at least three pairs of diametrically disposed stator pole pieces mounted about the rotor structure and defining stator pole faces at their inner ends, said rotor pole faces and said stator pole faces being axially aligned, windings surrounding at least one pole of each of said pairs of stator pole pieces, said windings in use being energized sequentially to cause rotation of the rotor structure, the rotor pole pieces each having circumferential extensions on opposite sides thereof, said extensions when a stator pole face is aligned with a rotor pole face, extending circumferentially beyond the stator pole face, the extensions having a smaller cross sectional area than the rotor pole face, the arrangement being such that depending upon the order in which the stator windings are energized, the rotor structure will move in one direction to minimize the reluctance of the magnetic path constituted by the stator and rotor structures.

3,959,673

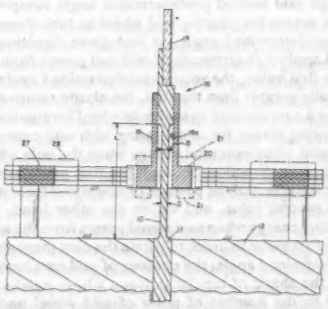
OSCILLATION MOTORS

Jean I. Montagu, Brookline, Mass., assignor to General Scanning, Inc., Watertown, Mass.

Filed Dec. 19, 1974, Ser. No. 534,583

Int. Cl.² H02K *31/00*

U.S. Cl. 310—38 **14 Claims**



1. A bearing-free oscillation motor, for example for driving an optical scanner or chopper, comprising:

a torsion shaft fixed against rotation at one end for rotational oscillation about its longitudinal axis and having a free end defining a mounting portion;

a rotor support member substantially more rigid in bending than said torsion shaft attached to said mounting portion and extending therefrom back along said torsion shaft;

a magnetically interactive rotor rigidly joined to said rotor support member at a point corresponding to the midregion of the effective length of said torsion shaft; and

a magnetically interactive stator means located adjacent said rotor with an air gap therebetween for cooperation with said rotor for inducing rotational oscillation of said rotor;

said torsion shaft and said rotor support member cooperating to provide a stiffer system in bending in a direction of change of said air gap than would result by mounting said rotor directly on said free end of said torsion shaft.

3,959,674

PULSE COUNTERS HAVING A MAGNETIC POLE WHEEL

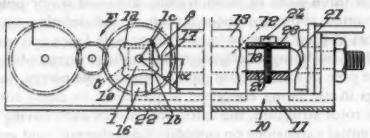
Nicolas Kokinopoulos, Dimocritov 32, Athens 136, Greece

Filed Sept. 24, 1974, Ser. No. 508,805

Claims priority, application Greece, Sept. 28, 1973, 49198; July 20, 1974, 4877; Aug. 1, 1974, 4942

Int. Cl.² H02K *37/00*

U.S. Cl. 310—49 R **10 Claims**



1. Pulse counter device comprising a wheel having magnetic poles arranged in regular intervals around the periphery thereof, an element magnetizable by means of a coil arranged to receive, at its terminals, signals representing pulses to be counted, these signals taking first and second values, said magnetizable element cooperating with the poles of said wheel so as to cause said wheel to rotate through a first predetermined angle, in a given direction, when the signal applied to the terminals of the coil passes from the first to the second value, means for rotating said wheel through a second predetermined angle, in the said given direction, when the signal at the terminals of the coil passes from the second to the first valve, and registering means for the pulses to be counted, said registering means being driven by the pole wheel so as to indicate an advance by one unit when said wheel has rotated in the given direction, the means for rotating the wheel through said second predetermined angle comprising elastic return means for causing said wheel to turn through the second predetermined angle, in said given direction, when the signal applied to terminals of said coil passes from the second to the first value, the second predetermined angle being substantially greater than the first, the elastic return means comprising a cam secured to said pole wheel for rotation therewith and spring means for cooperating with said cam so as to, on one hand, store potential energy when the pole wheel rotates, in the given direction, through the first predetermined angle under the effect of the passage of said signal from its first value to its second value, and to, on the other hand, restore this potential energy when said signal passes from the second value to the first value in order to rotate the cam through the second predetermined angle, the contour of said cam having substantially the shape of regular polygon whose number of sides is equal to the number of poles of said wheel and the spring means comprising a spring strip, said spring strip resting on one side of the regular polygonal shape cam when the said signal has the first value, and the free end of said strip passing from one side of the regular polygonal shaped cam to another side of said cam when the signal at the terminals of the coil passes from the first to the second value.

3,959,675

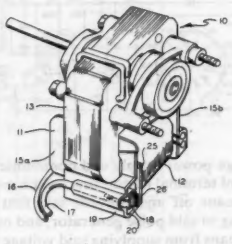
BOBBIN-FLANGE MOUNTED THERMAL PROTECTOR FOR ELECTRIC MOTORS

Max E. Lautner, and Paul P. Vincent, both of Watertown, N.Y., assignors to Gould Inc., Chicago, Ill.

Filed June 19, 1974, Ser. No. 480,636

Int. Cl.² H02K *11/00*

U.S. Cl. 310—68 C **2 Claims**



1. An electromagnetic coil for a small electric motor, comprising: a spool type bobbin of electrical insulating material having a tubular portion adapted to receive a metal core therein and flanges at either end extending radially outward, at least two insulated lead wires adapted to be connected to a source of electricity, a coil of enameled wire wound around the bobbin between the flanges and having two end wires, the flanges being slotted and the end wires projecting through the flange slots from the coil to the flange exterior surface, and a thermal sensing device having a metal body wall around one end of the device electrically connected as one terminal of the device, the other end of the device having a metal member projecting therefrom and being electrically connected as the other terminal of the device, one flange being formed with an integral enlargement having a cavity opening edgewise of the flange and extending along the outer suface of the flange, the cavity being divided along a portion of its length into a first chamber and a second chamber by an integral partition having a slot therethrough in its end adjacent the cavity open end, the first chamber having a cross-sectional configuration for closely receiving the end of a lead wire therein and the second chamber having a cross-sectional configuration for closely receiving the metal body wall of the device, one coil end being secured to and in electrical contact with the device projecting member, a first lead wire end lying in the first chamber and having a stripped portion extending through the partition slot and into the second chamber compressed between the device body wall therein and the partition for securing the first lead wire in the first chamber and for securing the first lead wire stripped portion in electrical contact with the device body wall, the second lead wire being secured to one of the bobbin flanges and electrically connected to the other coil end wire.

3,959,676

ALTERNATOR RECTIFIER BRIDGE AND METHOD OF ASSEMBLY

David L. Striker, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 23, 1974, Ser. No. 535,932

Int. Cl.² H02K *11/00*

U.S. Cl. 310—68 D **12 Claims**

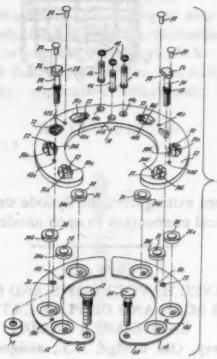
1. A poly-phase alternator rectifier bridge assembly arranged to be mounted on the end of an alternator comprising in combination:

a generally U-shaped plastic circuit member having a plurality of conductor members embedded therein and mutually electrically insulated thereby and including

a first plurality of apertures in the plastic for exposing each end of each conductor member and a second plurality of apertures extending through the plastic without exposing any of the conductor members;

a plurality of first terminal members projecting from the plastic, each first terminal member arranged to be in electrical communication with one of the conductor members;

first and second plate members having a plurality of diode receiving recesses formed in registry with the first plurality of circuit member apertures, arranged to be substantially coplanar, said plate members including a plurality of apertures in registry with said circuit member second apertures;



a plurality of diode members having spatially separated anode and cathode electrodes received within the diode recesses, said diodes oriented to have the cathode electrode of each diode within the recesses in the first plate in contact with the first plate and the anode electrode of each diode with the recesses in the second plate in contact with the second plate; and

a plurality of rivet members extending through at least some of the second plurality of circuit member apertures and the first and second plate member apertures in registry therewith, operative to fixedly mount said first and second plate members to said circuit member.

3,959,677

ELECTRIC MOTOR DEVICE AND HEAT SINK AND METHOD OF ASSEMBLING

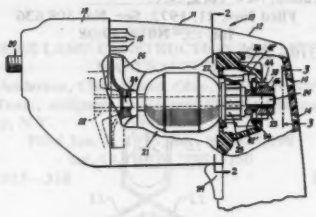
Dale Christian Grieb, Baltimore, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Division of Ser. No. 391,530, Aug. 27, 1973. This application Oct. 16, 1974, Ser. No. 515,366

Int. Cl.² H02K *7/08*

U.S. Cl. 310—90 **5 Claims**

1. In an electric motor device of the type comprising a housing of a thermoplastic material having air inlet and outlet portions; a shaft in said housing; axially aligned bearing means in said housing journalling said shaft; fan means mounted on said shaft for moving air through said housing between said inlet and outlet portions for cooling the interior of said housing; the improvement in which at least one of said bearing means includes an apertured metal bearing heat sink, said heat sink having a first set of apertures for the passage of cooling air, said heat sink also having a second set of apertures; and pin means integral with said housing extending through said second set of apertures for mounting said heat sink in a fixed location, said pin means including an enlarged portion thereof in engagement with the surface of said heat sink about said second set of apertures.



3,959,678

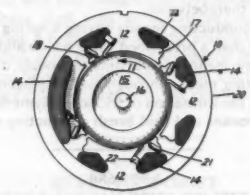
CONCENTRATED WINDING SALIENT-POLE SHADED POLE MOTORS HAVING MULTIPLE SHORT CIRCUITED SHADING COILS FOR EACH POLE

Joe T. Donahoo, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Oct. 2, 1972, Ser. No. 293,802

Int. Cl.² H02K *17/10*

U.S. Cl. 310—172 **9 Claims**

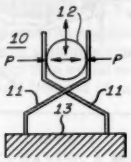


1. A shaded pole motor comprising a stator assembly having at least one excitable winding, a rotor assembly, and means for supporting the rotor assembly in spaced apart air gap defining relation with the stator assembly and for permitting rotation of the rotor assembly relative to the stator assembly during excitation of said winding; said stator assembly including a magnetizeable core having circumferentially spaced apart pole pieces; at least one of the pole pieces having a leading pole tip configured to establish a relatively high magnetic reluctance therealong, as compared to another region of such pole piece; said at least one of the pole pieces also having at least two short circuited shading coils disposed along the trailing pole tip thereof; and said pole pieces being spaced apart so that the leading pole tip of each pole piece is spaced from the trailing pole tip of the pole piece adjacent thereto; said rotor assembly including a short circuited squirrel cage winding, and the locked rotor torque to maximum torque ratio for the motor being greater than about thirty-three one hundredths.

3,959,679
MEANS FOR INHIBITING THE FORMATION OF FRICTION POLYMERS ON BRUSH AND SLIP RING ASSEMBLIES

Charles G. Buckley, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 21, 1972, Ser. No. 308,636
Int. Cl.² H01R *39/08*
U.S. Cl. 310—232 **9 Claims**



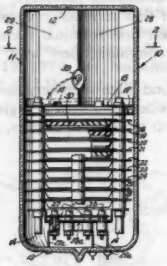
1. A brush and slip ring assembly comprising:
slip ring means,
block means disposed in the vicinity of said slip ring means and fixed with respect to said slip ring means for accommodating relative rotational motion between said block means and said slip ring means,
brush conducting means having a surface in contact with said slip ring means for exerting a contact pressure normal to said surface of contact and producing a coefficient of friction therebetween, and
spring conducting means coupled to said brush conducting means and affixed to said block means,
said combination of slip ring means, block means, brush conducting means and spring means being subject to low amplitude, high frequency vibrations which tend to produce sliding displacements between said slip ring means and said brush conducting means thereby forming friction polymers therebetween,
said spring conducting means having a spring constant of a value less than a prescribed value which allows said brush conducting means to be simultaneously displaced with said slip ring means through said displacements thereby inhibiting the formation of friction polymers between said slip ring means and said brush conducting means.

3,959,680
PHOTOMULTIPLIER TUBE HAVING A PLURALITY OF SENSING AREAS

John J. Morales, Huntington, Conn., assignor to S.R.C. Laboratories, Inc., Fairfield, Conn.

Filed Jan. 24, 1975, Ser. No. 544,016
Int. Cl.² H01J *39/06*, *39/02*
U.S. Cl. 313—95 **24 Claims**

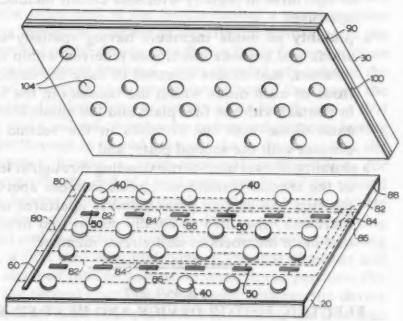
1. A plural sensing area photomultiplier tube comprising an envelope having a sensed matter receiving surface coated with photocathode material, a stem header axially aligned with the envelope and spaced from the surface, a plurality of axially aligned dynodes formed into a single unitary stack extending longitudinally along the axis of the tube between the stem header and the surface, the dynode nearest the surface being spaced from the surface, means for subdividing the space between the surface and the nearest dynode into a plurality of chambers aligned along the tube axis with each chamber having its own sensing area of the surface, an opening for leading electron flow from each chamber to the nearest dynode, means for causing each of the plurality of flows of electrons to be passed through the said single stack to be multiplied and including means for maintaining essentially separated each flow of electrons from the other flows of electrons as the flows pass simultaneously through the stack, anode means positioned adjacent the stem header and having a separate anode portion for each sensing area with each anode portion being positioned to receive only one of the flows of electrons exiting from the dynode stack, and an independent electrical connection to each anode portion.



3,959,681
DISPLAY PANEL HAVING ROWS AND COLUMNS OF COPLANAR SCAN AND DISPLAY CATHODES AND LARGE-AREA ANODE

Edgar L. Harvey, Old Bridge, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 23, 1974, Ser. No. 535,891
Int. Cl.² H01J *61/067*, *61/30*
U.S. Cl. 313—188 **9 Claims**



1. A display panel comprising:
a gas-filled envelope made up of a base plate and a face plate hermetically sealed together and including
an array of first display cathode electrodes, adapted for viewing, disposed in rows and columns and including means for energizing all of the display cathodes in each row simultaneously,
an array of second scan cathode electrodes, not to be viewed, disposed in rows and columns, with selected first and second cathode electrodes being disposed in operative relation with each other, and means for energizing all of the scan cathode electrodes in each column simultaneously and for energizing the columns of scan cathodes sequentially, said scan cathode electrodes exhibiting scan cathode glow when energized and generating excited particles,

the scan cathodes and display cathodes thus being disposed in operative pairs such that, as the columns of scan cathodes are energized, the display cathode associated with each scan cathode can be energized and caused to exhibit cathode glow with the aid of excited particles generated by the associated scan cathode,

a single large-area transparent anode electrode disposed on said face plate in operative relation with all of said first and second cathode electrodes, and

masking means forming the anode electrode into discrete operative areas, each of which is in operative relation with at least one operative pair of scan and display cathodes.

3,959,682

ELECTRIC LAMP

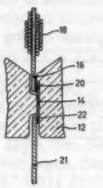
Gustaaf Adolf Wesselink, Emmasingel; Arie Koelewijn, and Hendrik Roelofs, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 27, 1975, Ser. No. 553,543

Claims priority, application Netherlands, Mar. 11, 1974, 7403204

Int. Cl.² H01J *5/50*

U.S. Cl. 313—217 **6 Claims**



1. Electric lamp having a hermetically sealed gas-filled hard-glass or vitreous-silica lamp envelope provided with a current lead-in which is sealed into a portion of the lamp envelope and comprises a foil mainly consisting of molybdenum and a current supply lead mainly consisting of tungsten which is secured to the foil by a welded joint and extends into the lamp envelope, characterized in that the welded joint contains iron or an alloy of at least 50% by weight of iron and one or more of the elements scandium, titanium, vanadium chromium, manganese, cobalt, nickel and copper as the welding agent.

3,959,683

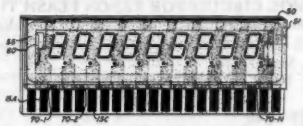
GAS DISCHARGE DISPLAY PANEL DEVICE SPUTTER RESISTANT SEGMENTED ELECTRODES

George A. Kupsky, State College, Pa., assignor to Panel Technology, Inc., Lewistown, Pa.

Filed Oct. 10, 1974, Ser. No. 513,802

Int. Cl.² H01J *61/067, 61/66*

U.S. Cl. 313—218 **2 Claims**



1. A gaseous breakdown display device comprising a dielectric substrate, a viewing plate, seal means securing said viewing plate in sealing engagement with the substrate to form a sealed envelope and anode and cathode electrodes within the sealed envelope, said cathode electrodes being printed conductive ink electrodes cured in situ on said substrate and containing a sputter resistant material selected from the group consisting of silicon carbide, tungsten boride, chromium boride, molybdenum boride, and molybdenum disilicide, said sputter resistant material being incorporated in powder form in said conductive ink.

3,959,684

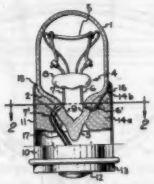
MINIATURE LAMP CONSTRUCTION AND METHOD OF MANUFACTURE

John R. Anderson, Chesterland, Ohio, and Steve Boros, Memphis, Tenn., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 2, 1975, Ser. No. 537,898

Int. Cl.² H01J *5/48, 5/50*

U.S. Cl. 313—318 **10 Claims**



1. In a miniature size electric lamp having a tungsten filament connected betweea a pair of wire leads, which are hermetically sealed within a tubular shaped glass envelope, with said wire leads extending outwardly from said envelope and being electrically connected to a cylindrical metal base shell having an inturned rim, the improvement which comprises having one flattened wire lead extending between the envelope wall and the rim of the base shell so as to lie in a plane approximately tangent to the envelope wall and being disposed between the wall of said envelope and the rim of said base shell, said wire lead being adhesively bonded to the inside rim of the base shell with an electrically-conducting base cement utilizing a heat-cured organic polymer binder having a finely divided conductive solid dispersed therein, and the remaining lead being partially coated with electrical insulation to prevent electrical shorting with the electrically-conducting cement.

3,959,685

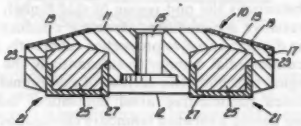
HEAT SINK TARGET

Ronald D. Konieczynski, 3947 Sprague Road, North Royalton, Ohio 44133

Filed Feb. 18, 1975, Ser. No. 550,845

Int. Cl.² H01J *35/08*

U.S. Cl. 313—330 **28 Claims**



1. In an X-ray target designed to be rotated on a central axis while causing X-rays to be directed from a finite plurality of angular intervals throughout a surface of the target, an improvement in the target comprising a base structure of extremely high melting point material, at least one cavity in said base structure, encapsulating means for each said cavity constructed of a high melting point material compatible with that of said base structure and filler means for each said cavity having a melting point substantially near a maximum operat-

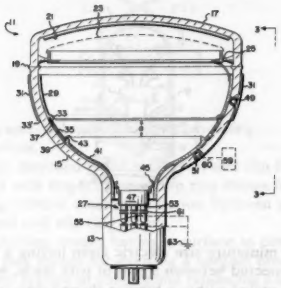
ing temperature of the X-ray target permanently encapsulated by said base structure and said encapsulating means.

3,959,686

CATHODE RAY TUBE CONSTRUCTION HAVING DEFINED PROCESSING AND OPERATIONAL MEANS INCORPORATED THEREIN

Charles A. Davis; Anthony V. Gallaro, both of Auburn, and Ralph E. Neuber, Seneca Falls, all of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 6, 1975, Ser. No. 538,506
Int. Cl.² H01J *29/02, 31/00*
U.S. Cl. 313—450 **4 Claims**



1. An improvement in a cathode ray tube having an envelope formed of a sequential integration of a forwardly oriented viewing panel, an intermediate funnel portion, and a rearward neck portion providing an enclosure for internal structural components including a multi-electrode electron generating assembly positioned in said neck portion in a manner to project at least one electron beam to impinge a cathodoluminescent screen disposed on the interior surface of said panel, said tube having an electrical conductive coating disposed on a portion of the exterior surface of said funnel beginning adjacent the transition region of the panel and funnel portions and extending rearward therefrom to a defined boundary on said funnel, said improvement being means for expediting improved tube processing and subsequent tube operation comprising in combination:

a first low resistive electrical conductive coating disposed in a substantially circumferential manner on substantially the forward portion of the interior surface of said funnel in substantially superposed relationship with at least a portion of said exterior conductive coating, said first coating extending rearward from substantially the region adjacent said panel-funnel transition to a rear boundary in substantially the mid-region of said funnel;

a high resistive arc-inhibiting electrical conductive coating having discrete resistive properties adherently disposed in a circumferential manner to substantially the intermediate region of the interior surface of said funnel to provide a bonded particle-free areal deposition, said resistive coating having a forward boundary contiguous to the rear boundary of said first low resistive conductive coating and a rear boundary dimensionally removed from said forward boundary;

a second low resistive electrical conductive coating disposed in a substantially circumferential manner on substantially the rear region of the interior surface of said funnel, said second low resistive coating having a forward boundary contiguous to the rear boundary of said high resistive coating and extending areally therefrom into the forward region of said integrated neck portion to facilitate electrical connection with the terminal section of said electron generating assembly;

first electrical connective means oriented to traverse the wall of the forward region of said funnel thereby providing an electrical connection therethrough to effect contact with said first low-resistive coating to provide an operational connection for facilitating an electrical path across said high resistive and said second low resistive coatings to said electron generating assembly; and

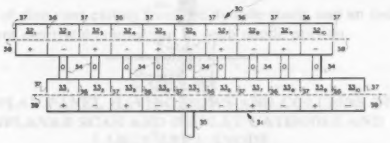
second electrical connective means spatially related rearward of said first electrical connective means and oriented to traverse the wall of said funnel portion thereby providing a separate electrical connection therethrough to effect contact with said second low resistive coating for facilitating improved tube processing prior to tube operation.

3,959,687

INTERCOUPLED LINEAR ACCELERATOR SECTIONS OPERATING IN THE $2\pi/3$ MODE

Stanley O. Schriber, Deep River, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Mar. 3, 1975, Ser. No. 555,045
Claims priority, application Canada, Aug. 1, 1974, 206112
Int. Cl.² H01J *25/10*
U.S. Cl. 315—5.42 **10 Claims**



1. A linear accelerator system having N resonant cells energized in a standing wave mode comprising:

a first series of $(N + 1)/3$ successively positioned resonant cells forming a first linear accelerating section, wherein successive pairs of said first resonant cells have energy coupling slots and said first resonant cells having beam holes aligned along a first axis;

a second series of $(N + 1)/3$ successively positioned resonant cells forming a second linear accelerating section wherein successive pairs of said second resonant cells have energy coupling slots and said second resonant cells having beam holes, aligned along a second axis;

$[(N + 1/3] - 1$ resonant coupling cells for coupling energy between the even numbered resonant cells in said first accelerating section and the odd numbered cells in said second accelerating section, and for coupling energy between the odd numbered cells in said first accelerating section and the even numbered cells in said second accelerating section; and

source means coupled to one of said resonant cells to excite said system in a standing wave mode.

3,959,688

CONTROL CIRCUIT FOR XENON FLASH TUBES

Robert P. Bonazoli, Hamilton, and Ellison H. Kirkhuff, Needham, both of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Jan. 3, 1975, Ser. No. 538,439
Int. Cl.² H05B *41/14*
U.S. Cl. 315—240 **5 Claims**

1. A circuit for controlling the light intensity of a high voltage discharge tube over a wide range of intensities comprising:

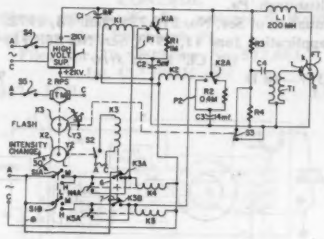
a high voltage supply,

a plurality of storage capacitors connected in parallel across said supply,

a discharge device connected in parallel with the capacitors for discharging the capacitors,

means for triggering the discharge device,

at least one of the storage capacitors having in series therewith a low resistance discharge path and a high resistance path in parallel,



and switch means to select one of the paths,

the high resistance path and said one storage capacitor having a time constant substantially longer than the discharge time through a low resistance path, so that until the low resistance path is selected by the switch means said one storage capacitor is not substantially discharged relatively to the high voltage supply.

3,959,689

TWISTING DISTORTION CORRECTING CIRCUITRY

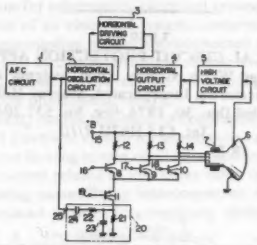
Junichi Ikoma, Tokyo, Japan, assignor to Hitachi, Ltd., Japan

Filed June 10, 1974, Ser. No. 477,972

Claims priority, application Japan, June 11, 1973, 48-65688

Int. Cl.² H01J 29/56

U.S. Cl. 315—370 5 Claims



1. In a television receiver having a horizontal oscillation circuit whose frequency is controlled by an input signal applied thereto and whose average horizontal deflection current increases and decreases in response to reproduction of a bright area and a dark area after the bright area, respectively, the improvement including

a twisting distortion correcting circuit comprising:

detecting means to which a signal to be detected with a waveform analogous to that of the beam current of the cathode ray tube is supplied, for detecting a change of said signal to be detected, and

correcting signal generator means to which the output signal of said detecting means is supplied, for operatingly removing high frequency components and d.c. components from said output signal of said detecting means, so as to form a control signal with a waveform analogous to that of the average horizontal deflection current, in which the output signal of said correcting signal generator means is applied to said horizontal oscillation circuit, with a phase capable of producing decrease and increase in the oscillation frequency in response to the increase and decrease in the beam current.

3,959,690

CORONA DISCHARGE ELEMENT

Klaus Leibrecht, Hofheim, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Germany

Continuation of Ser. No. 342,627, March 19, 1973. This application Oct. 4, 1974, Ser. No. 512,201

Claims priority, application Germany, Mar. 20, 1972, 2213425

Int. Cl.² H01T 19/04

U.S. Cl. 317—4 6 Claims

1. A corona discharge element consisting of a planar metal saw blade, two longitudinal edges of which are provided with two sets of pointed projections, the peaks of one set of projections lying in a plane which contains one side of the blade and the peaks of the other set of projections lying in another plane which contains the other side of the blade, said discharge element comprising:

a. a common plane in which the peaks of all of the projections are lying and which is perpendicular to said planes,

b. said projections have the shape of a four-sided pyramid, the base of which is rectangular,

c. said bases of adjacent projections are adjoining without clearance between each projection.

3,959,691

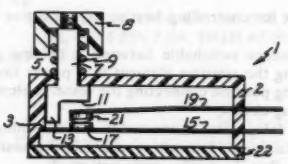
MOTOR PROTECTOR

David E. Clarke, Attleboto, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 16, 1973, Ser. No. 351,723

Int. Cl.² H02H 7/08

U.S. Cl. 317—13 B 12 Claims



1. A control device comprising base means, a control means movable on said base means between first and second control positions, actuator means secured between said control means and said base means, said actuator means being formed of a selected metal alloy to be deformed from an original configuration when said control means is moved into one of said control positions while said alloy displays a relatively low modulus of elasticity below a transition temperature and to abruptly return to its original configuration and to display a relatively higher modulus of elasticity to move said control means into the other of said control positions when said alloy is heated above said transition temperature, reset means mounted for sliding manual movement on said base means to move said control means toward said one control position when said actuator means alloy is in its low modulus condition so that the extent of said sliding movement determines the

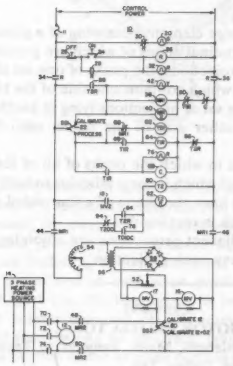
extent of deformation of said actuator means, and means for limiting said manual movement of said reset means to limit deformation of said actuator means to a selected extent to deform said actuator means into a selected second configuration in response to manual movement of said reset means, whereby movement of said control means is effected between said control positions as said actuator means alloy is heated and cooled above and below said transition temperature.

3,959,692

MONITOR AND CONTROLLER FOR HEATING A RESISTIVE ELEMENT

Donald A. Wetzel, Upper St. Clair, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 18, 1974, Ser. No. 507,161
Int. Cl.² H02H *7/08*
U.S. Cl. 317—13 B **1 Claim**



1. A circuit for controlling heating of a resistive element comprising:

switching means switchable between a heating position, connecting the resistive element to a power line, and a monitoring position connecting the resistive element to a monitoring circuit;

a first time delay relay, connected to said switching means, for maintaining said switching means in the heating position for a first time delay when activated;

a resistor connected in series with the resistive element when said switching means is in the monitoring position;

a fixed potential connected across the resistive element and said resistor in series when said switching means is in the monitoring position;

a second time delay relay connected to be activated when said switching means is switched from the heating position to the monitoring position;

a voltage sensitive relay connected to be activated until the voltage drop across said resistor decreases below a predetermined level; and,

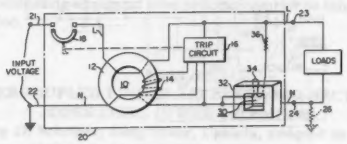
said second time delay and said voltage sensitive relay connected to said switching means for switching said switching means to the heating position when a second time delay, determined by said second time delay relay, and the voltage across said resistor, sensed by said voltage sensitive relay, is below a predetermined level.

3,959,693

GROUND FAULT INTERRUPTER APPARATUS WITH MEANS PROTECTING AGAINST A GROUNDED NEUTRAL CONDITION

Kenneth R. Coley, Fairfield, and John J. Misencik, Shelton, both of Conn., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 218,771, Jan. 18, 1972. This application June 11, 1973, Ser. No. 368,915
Int. Cl.² H02H *3/16*
U.S. Cl. 317—18 D **9 Claims**



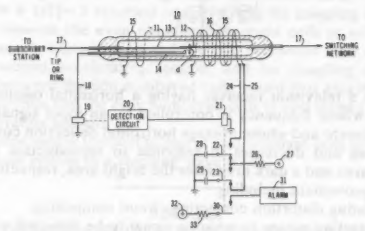
1. Ground fault interrupter apparatus comprising: a differential current transformer including a magnetic core, a plurality of primary windings on said core, each being one of the line and neutral conductors of an A.C. electrical distribution system, a secondary sensing winding on said core for sensing current unbalance between said primary windings; means responsive to a predetermined sensing signal to open said line conductors; an additional transformer comprising a second magnetic core, a primary winding on said second magnetic core comprising a conductor connected between said line and neutral conductors, a secondary winding on said additional transformer comprising said neutral conductor of said power system, said core being saturated during a part of each half cycle of an A.C. wave presented by an external power system on said line and neutral conductors.

3,959,694

ELECTRICAL CIRCUIT PROTECTION APPARATUS

Edward George Walsh, Galena, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 30, 1974, Ser. No. 537,204
Int. Cl.² H02H *3/10*
U.S. Cl. 317—18 R **9 Claims**



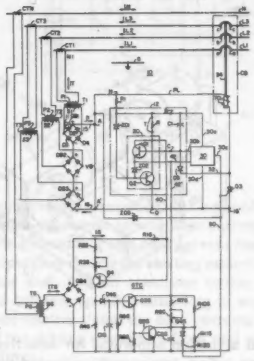
1. An electrical circuit protective arrangement comprising a relay device comprising a pair of normally closed magnetically responsive reed springs included in said electrical circuit, said springs being adapted to open responsive to a predetermined current therethrough, a probe element presenting a predetermined gap with a first of said springs when said springs are closed and making electrical contact with said first spring when said springs are open, and an envelope for enclosing said probe element and said reed springs having a gas therein of a character ionizable at said gap in the presence of a predetermined voltage across said probe element and said first spring, and detection circuit means including said first spring and said probe element energized responsive to a cur-

rent of a predetermined level therein for generating a control signal.

3,959,695
CIRCUIT INTERRUPTER WITH GROUND FAULT TRIP CONTROL

Alan B. Shimp, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 29, 1975, Ser. No. 572,693
Int. Cl.² H02H *3/08*
U.S. Cl. 317—33 R **13 Claims**



1. Apparatus for interrupting electrical ground fault current in a conductor of an electrical system, comprising:

a. circuit interrupting means interconnected with said conductor, said circuit interrupting means having a current actuated means for causing the interrupting operation of said circuit interrupting means;

b. first sensing means disposed in cooperating relationship with said electrical system for sensing the value of electrical current flowing in said conductor and for providing an output current related to said latter value of current, said first sensing means being interconnected with said current actuated means for supplying actuating current thereto;

c. second sensing means disposed in cooperating relationship with said electrical system for sensing the value of ground fault electrical current flowing in said conductor and for providing an output current related to said latter value of current, said second sensing means being interconnected with said current actuated means for supplying actuating current thereto;

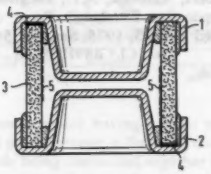
d. switch means interconnected in circuit relationship with said current actuated means for controlling the flow of electrical current therethrough; and

e. control means interconnected with said first sensing means and said second sensing means and said switch means, said control means actuating said switch means to thus cause a portion of said first sensing means output current to flow through said current actuated means to thus cause said interrupting operation when said value of electrical current flowing in said conductor attains a first predetermined value, said control means actuating said switch means to cause a portion of said second sensing means current to flow through said current actuated means to thus cause said interrupting operation when said value of ground fault current flowing in said conductor attains a second predetermined value, said control means providing a return path for said portion of our first sensing means output current and said portion of said second sensing means output current which path is an alternate to said path through said current actuated means only whenever neither said current flowing in said conductor nor said ground fault current flowing in said conductor has attained said first or said second predetermined values respectively.

3,959,696
OVER VOLTAGE ARRESTER

Gerhard Lange, and Gerhard Peche, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 8, 1973, Ser. No. 330,886
Claims priority, application Germany, Feb. 15, 1972, 2207009
Int. Cl.² H02H *9/06*
U.S. Cl. 317—62 **9 Claims**

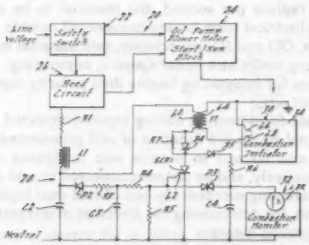


1. An over voltage arrester formed with a gas-tight housing having a pair of electrodes supported at opposite ends of a tubular insulator member, at least one of said electrodes being in electrical contact with a strip of electrically conductive material supported on the surface of said tubular insulator and extending from said one electrode toward the other electrode, said electrodes being fused by a glazed connection to the ends of said tubular member, and said strip being in direct contact with said electrode in the area of the glazed connection between said electrodes and said tubular member.

3,959,697
OIL BURNER SAFETY CONTROL SYSTEM WITH INTEGRAL IGNITION

Frederick T. Bauer, and Frederick J. Geary, both of Holland, Mich., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 29, 1974, Ser. No. 528,157
Int. Cl.² F23N *5/08*; **H01H** *47/00*
U.S. Cl. 317—151 **4 Claims**



1. In an electrical control system for oil burners, the combination comprising an electric motor including a start winding and a run winding electrically connected in parallel and each adapted to be connected to a main line source of AC current, motor control means connected in series with said start winding and in parallel with said run winding, a control circuit

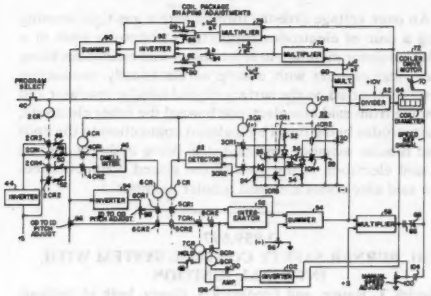
including plasma generating means, combustion initiation means and burner ignition detection means, means interfacing between said control circuit and said motor control means, said ignition detection means being effective to interrupt the flow of electrical current through said interfacing means, said plasma generating means including trigger means and electronic brake means, said trigger means including a silicon controlled rectifier having an anode, a cathode and a gate, a pair of resistors, a diode, a capacitor and a trigger diode, one of said resistors, said diode, said capacitor and said trigger diode being connected across said anode and said cathode of said silicon controlled rectifier, the other of said resistors being connected to said gate.

3,959,698

SPEED CONTROL SYSTEM FOR A COILER DRIVE MOTOR

Roger B. Herbert, Amherst, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 23, 1975, Ser. No. 543,377
Int. Cl.² B59H *59/38*
U.S. Cl. 318—6 **10 Claims**



1. A speed control system for a motor driving a coiler rotating at ω radians per second, the material to be rolled in a hollow cylindrical form having preselected outside and inside diameters, OD and ID respectively, said material being fed to the rotating coiler at a linear speed s, comprising:

a. means for integrating having dual polarity inputs and an output ω/s;

b. means for detection having inputs connected to receive a signal which is a function of said preselected diameters OD and ID and to receive said integrated output ω/s respectively, and an output connected to said dual inputs for selecting successively one of said dual inputs for activation, for determining the direction of integration of said integrating means;

c. means for multiplying adapted to receive said integrated output ω/s and to deliver the multiplied products: ω^2/s^2, ω^3/s^3 and ω^4/s^4;

d. means for coil package shaping adapted to receive said multiplied products and to deliver the products $a\omega^2/s^2$ $b\omega^3/s^3$ and $c\omega^4/s^4$ where a, b, and c are constants;

e. means for summing for receiving said products $a\omega^2/s^2$, $b\omega^3/s^3$ and $c\omega^4/s^4$ for delivering the summed signal

$$\frac{a\omega^2 + b\omega^3 + c\omega^4}{s^2}$$

to said dual inputs of said integrators; and

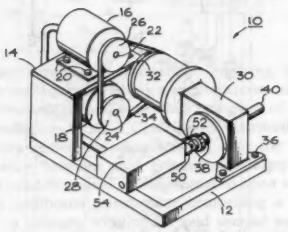
f. additional means for receiving said output ω/s and multiplying it by s to deliver the speed reference signal ω to said motor.

3,959,699

BI-DIRECTIONAL MOTOR DRIVE SYSTEM

Fred Brail, 6529 West Blvd., Inglewood, Calif. 90302

Continuation of Ser. No. 366,419, June 4, 1973, abandoned.
This application Nov. 25, 1974, Ser. No. 526,549
Int. Cl.² H02P *5/46*
U.S. Cl. 318—45 **10 Claims**



1. Electrical actuation apparatus for selectively driving a device between a first, temporarily-occupied position and a second, home position comprising:

A. a first electric motor for driving the device to said first position and a second electric motor for driving the device to said second position;

B. transmission means coupling said motors mechanically to each other and to the device whereby each motor, when energized, drives both the other motor and said device to the corresponding selected position;

C. power circuit means for coupling said motors to a source of electrical power; and

D. a start switch and control means in said circuit means including

1. means for selectively energizing only one of said motors by said circuit means at any given time and

2. first delay means for both interrupting the energization of the second motor upon the activation of the start switch and thereafter delaying the energization of the first motor by an interval selected to permit the motors and transmission means to come to rest.

3,959,700

SPEED CONTROL DEVICE FOR TRANSISTOR MOTOR

Naokatsu Sugiura, Hachioji, and Kenichi Suzuki, Isehara, both of Japan, assignors to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1974, Ser. No. 516,732
Claims priority, application Japan, Oct. 23, 1973, 48-123010[U]
Int. Cl.² H02K *29/00*
U.S. Cl. 318—138 **2 Claims**

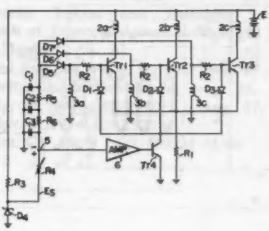
1. A speed control device for a transistor motor having a stator provided with field windings and a rotor consisting of a permanent magnet, comprising

position detecting windings wound at corresponding positions to said field windings, respectively, to detect the position of said rotor,

a switching circuit including a plurality of driving transistors whose emitter-collector circuits are connected in series to said field windings, respectively, and whose bases are

supplied with the outputs, respectively, from said position detecting windings, for changing-over in turn the currents of said field windings in accordance with the output signals from said position detecting windings,

a base current control transistor for said driving transistors whose emitter-collector circuit is commonly connected through diodes to the respective bases of said driving transistors, and



a servo circuit which is supplied with a speed control signal and supplies its output to said base current control transistor, for maintaining said base current control transistor to be inoperative during the starting period of said transistor motor and, as said transistor motor approaches a specified rotation speed, controlling in accordance with said speed control signal the base currents applied to the bases of the driving transistors from said position detecting windings.

3,959,701

DRIVE SYSTEM FOR ELECTRICALLY DRIVEN VEHICLES

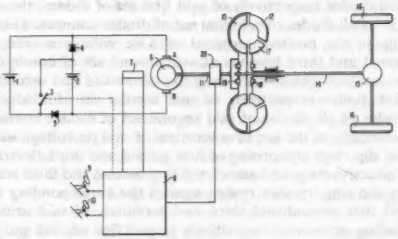
Christian Bader, Stuttgart, Germany, assignor to Firma Deutsche Automobilgesellschaft mbH, Hannover, Germany

Filed Aug. 1, 1973, Ser. No. 384,634

Claims priority, application Germany, Aug. 2, 1972, 2237963

Int. Cl.² H02P 3/16

U.S. Cl. 318—139 **23 Claims**



1. A drive system for electric vehicles, characterized by an electric motor means having an excitation means, a driving battery means for supplying power to the electric motor means and adapted to be switched by a switch means from a partial voltage to the full battery voltage, a hydraulic torque converter means operatively connected with the electric motor means, and electronic control means operatively connected with the switch means and with the excitation means of the motor means, the electronic control means being controlled in response to at least one of the motor rotational speed, a driving control member and a brake control member.

3,959,702

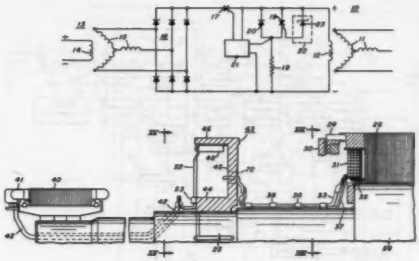
STARTING CONTROL SYSTEM FOR SYNCHRONOUS MOTORS

Gurney L. Godwin, Pittsburgh, and Donald R. Rippin, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 17, 1973, Ser. No. 389,420

Int. Cl.² H02P 1/46

U.S. Cl. 318—181 **11 Claims**



1. In a synchronous motor having a rotor member with a plurality of salient poles thereon, a field coil disposed on each pole, said field coils being connected together to constitute a field winding, a second coil on each pole, said second coils being connected together to constitute a resistance winding, means for providing direct current excitation for said field winding, and control means for connecting said resistance winding across the field winding during starting of the motor and for disconnecting the resistance winding and applying direct current excitation to the field winding for synchronous operation of the motor.

3,959,703

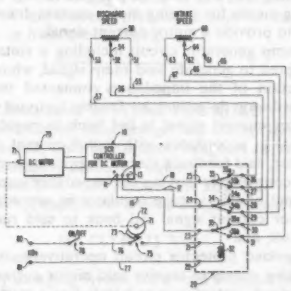
SPEED CONTROL FOR PUMP OF FILLING MACHINES

Sidney Rosen, 4119-27 Fordleigh Road, Baltimore, Md. 21215

Filed Dec. 24, 1974, Ser. No. 536,102

Int. Cl.² H02P 7/36

U.S. Cl. 318—305 **15 Claims**



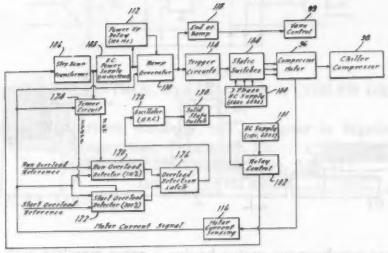
1. A control device for a filling machine operable to fill containers with a product by the use of pump means having intake and discharge strokes and including pump shaft means, characterized by drive means for driving the pump shaft means, and control means for selectively controlling the speed of the drive means in dependence on the angular position of the pump shaft means so that the speed of the intake stroke is greater than the speed of the discharge stroke of said pump means.

3,959,704

SOLID STATE MOTOR STARTER AND OVERLOAD PROTECTOR CIRCUIT

Terrance Francis McCrea, Cocoa, Fla., assignor to Fedders Corporation, Edison, N.J.

Filed Nov. 21, 1974, Ser. No. 526,030
Int. Cl.² H02H 7/08
U.S. Cl. 318—387 9 Claims



1. A static starter and overload protector circuit for controlling the application of triggering pulses to solid state static switch means connected between a source of A.C. power and an A.C. motor, said circuit comprising:

a D.C. power supply;

means for energizing said D.C. power supply from an A.C. power supply;

a static starter circuit including a ramp generator circuit for generating a ramp signal in response to energization of said D.C. power supply;

means operatively coupled to said ramp generator circuit and responsive to the ramp signal thereof for controlling the application of said triggering pulses to said switch means so as to cause said motor to be accelerated to running speed as said ramp is generated;

sensing means for sensing motor current drawn by the motor to provide a motor current signal;

said ramp generator circuit including a voltage regulator, adapted to generate said ramp signal, whose output is a function of the impedance connected thereto, and a closed-loop de-generative feedback circuit via which the motor current signal is fed back to regulate the ramp signal in accordance with motor current drawn by the motor, said feedback circuit comprising a control circuit for controllably varying the impedance connected to the output of said voltage regulator in accordance with the motor current signal fed back to said ramp generator circuit; and

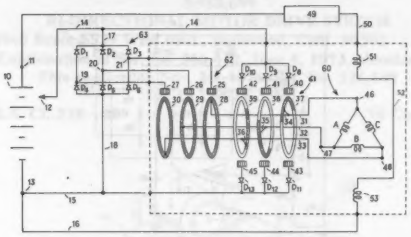
an overload protector circuit operatively coupled to said sensing means to receive said motor current signal, said overload protector circuit including a start overload circuit for comparing said motor current signal with a start overload reference signal for a time interval sufficiently long to permit completion of the generation of the ramp under normal motor starting conditions and a run overload circuit for comparing said motor current signal with a run overload reference signal after said time interval, said overload protector circuit comprising output means for causing termination of said triggering pulses if the motor current signal exceeds the start overload reference signal during said time interval and thereafter if the motor current signal exceeds the run overload reference signal.

3,959,705

DIRECT CURRENT MOTORS WITH IMPROVED COMMUTATION

Jalal Tawfiq Salihi, 20 Kahdena Road, Morristown, N.J. 07960

Filed Dec. 27, 1974, Ser. No. 536,961
Int. Cl.² H02K 13/00
U.S. Cl. 318—439 15 Claims



1. A separately excited two pole direct current motor system comprising, stationary field windings with first and second terminals, rotating armature, armature windings, commutators and associated stationary brushes, slip rings and associated stationary brushes, a full wave bridge rectifier, first and second set of diodes each set comprising of first, second and third diodes, said armature windings comprising a three phase winding with first second and third terminals, said commutators comprising first second and third commutator rings and associated first and second sets of stationary commutator brushes, said three commutator rings being mechanically identical each having an electrically conductive segment not exceeding 120° of the commutator ring surface and the rest of the surface being non-conductive, each said conductive segment of said three commutator rings being displaced symmetrically by 120° with respect to the other two segments whereby leading one and lagging the other segment, each said first and second set of commutator brushes comprising a first, second and third brushes, each said brush resting against a corresponding one of said first, second and third commutator rings, said first and second sets of commutator brushes being on diametrically opposite sides of the said commutators, first second and third brushes of said first set of commutating brushes connected electrically to anodes of first second and third diodes respectively of said first set of diodes, the cathodes of all diodes of said first set of diodes connected electrically to the positive terminal of a dc voltage source, first second and third brushes of said second set of commutator brushes connected electrically to cathodes of first second and third diodes respectively of said second set of diodes, the anodes of all diodes of said second set of diodes connected electrically to the negative terminal of said dc voltage source, said slip rings comprising of first second and third electrically conductive rings and associated first second and third stationary slip ring brushes resting against the corresponding rings, said first second and third end terminals of said armature winding connected respectively to said first second and third commutator segments such that each said winding terminal is electrically conductive with a conducting segment of one of the corresponding said commutator rings, also said first and second and third end terminals of said armature winding connected respectively to said first second and third slip rings such that each winding terminal is electrically conductive with one of said three slip rings, said full wave bridge rectifier comprising three pairs of first and second diodes, the anode-cathode junction of each pair of said three pairs of first and second diodes being electrically connected to one of the said three slip ring brushes, the cathode ends of all said three pairs of first and second diodes connected together by a first conductor, the anode ends of all said three pairs of first and

second diodes connected together by a second conductor, said first conductor connected to the positive terminal of said dc voltage source, said second conductor connected to the negative terminal of said dc voltage source, said stationary field winding energized separately from said dc voltage source through a field controller.

3,959,706

CHARGER

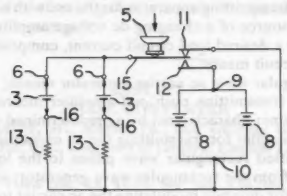
Kenichi Mabuchi, Tokyo, and Yoshihisa Tsuchimochi, Ichikawa, both of Japan, assignors to Mabuchi Motor Co. Ltd., Tokyo, Japan

Filed Aug. 20, 1974, Ser. No. 498,985

Claims priority, application Japan, Aug. 25, 1973, 48-99803[U]; Aug. 25, 1973, 48-9980[U]; Aug. 27, 1973, 48-100449[U]; Mar. 4, 1974, 49-25767[U]

Int. Cl.² H02J 7/00; H01M 45/04

U.S. Cl. 320—2 **30 Claims**



1. A charger comprising, in combination, a first case provided with a cell receiving space for mounting therein one or more cells to be charged, a charging circuit, a discharging circuit and a manual change-over switch for controlling the charging and the discharging circuit for one or more cells to be charged mounted in said cell receiving space, said manual change-over switch comprising a push button, a movable contact member having a space therein and a resilient piece movable upon depression of said push button and a fixed contact member resiliently supported and positioned in the space in said movable contact member, and a second case releasably coupled to said first case, said second case containing a plurality of source cells serving as the charging power source for the cell to be charged, said change-over switch having a normally closed contact to make the discharging circuit for the cell to be charged and a normally open contact to make the charging circuit for the cell to be charged.

16. A charger comprising, in combination, a first case provided with a cell receiving space for mounting therein one or more cells to be charged, a charging circuit, a discharging circuit and a manual change-over switch for controlling the charging and the discharging circuit for one or more cells to be charged mounted in said cell receiving space, and a second case for containing a plurality of source cells serving as the charging power source for the cell to be charged, at least one of said first and second cases being deformable said change-over switch having a normally closed contact to make the discharging circuit for the cell to be charged and a normally open contact to make the charging circuit for the cell to be charged, said charger further including elastic terminal pieces secured to the lower surface of the first case, and means to couple the first and the second cases together, said coupling means becoming disconnected by the elastic action of said terminal pieces upon deformation of at least one of the first and the second cases.

3,959,707

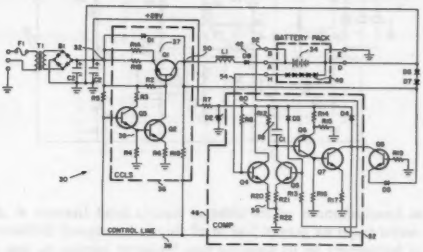
BATTERY CHARGER HAVING FAST CHARGE RATE AND HIGH RELIABILITY

Charles W. Stephens, Orlando, Fla., assignor to Martin Marietta Corporation, Orlando, Fla.

Filed Oct. 1, 1973, Ser. No. 402,642

Int. Cl.² H02J 7/04

U.S. Cl. 320—39 **20 Claims**



1. A battery charger for charging a temperature-sensitive battery in a rapid manner without damage to the battery, said battery being equipped with means for providing a reference voltage whose level changes with battery temperature similar to the theoretical battery voltage change with temperature, said battery charger being connected to the positive and negative terminals of the battery to be charged and including a current-carrying conductor in which is disposed an active current-conducting switch device, through which device, charge current flows to the battery, said active current-conducting switch device having an input to which is connected a control line, positive feedback means connected to said control line for causing the current through the active current-conducting switch device to increase to a value determined by a signal present on the control line, and thereafter diminish essentially to zero, thus creating a sawtooth shaped charge current, and means sensitive to the comparison of said reference voltage with the actual battery voltage for providing on said control line, a signal to effectuate the operation of said active current-conducting switch device, to bring about a diminishment of the average value of the sawtooth shaped charge current and thereby prevent damage to the battery from heating or from overcharging.

3,959,708

BATTERY CHARGING SYSTEMS FOR ROAD VEHICLES

Maurice James Allport, Stourbridge, and David Gordon Williams, Harborne, both of England, assignors to The Lucas Electrical Company Limited, England

Filed Dec. 4, 1974, Ser. No. 529,355

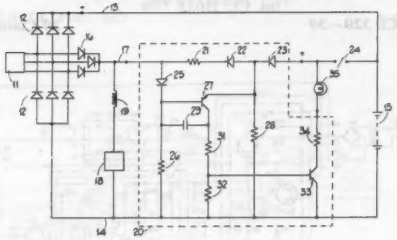
Claims priority, application United Kingdom, Dec. 8, 1973, 57011/73

Int. Cl.² H02J 7/14

U.S. Cl. 320—48 **4 Claims**

1. A battery charging system for a road vehicle comprising in combination an alternator and associated rectifier supplying power to first and second d.c. supply lines between which the battery is connected, a third supply line which is fed by the alternator and in use is at a potential substantially equal to the potential of the first supply line, a voltage regulator connected between the third and second supply lines and controlling the output of the alternator, a series circuit interconnecting the third and first supply lines, said series circuit including a resistor and the ignition switch of the vehicle, and switching means sensitive to the potential across said resistor for holding a warning lamp off provided the third supply line is at substantially the same potential as the first supply line, said series

circuit further including a diode the diode preventing flow of current from the third supply to the first supply, and the



switching means being sensitive to the potential across the resistor and diode.

3,959,709

MULTI-PHASE POWER SUPPLIES

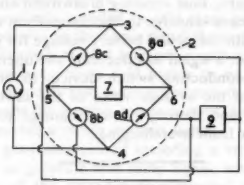
Reginald Tom Irish, Shrivenham, England, assignor to British Secretary of State for Defence, London, England

Filed Oct. 18, 1974, Ser. No. 515,955

Claims priority, application United Kingdom, Oct. 19, 1973, 48909/73

Int. Cl.² H02M 5/14

U.S. Cl. 321—7 **11 Claims**



1. Apparatus for converting an alternating current power supply having a single phase of given period to a power supply having a plurality of phases, said apparatus comprising an electrical bridge network having an input connected to said single phase, an output, and four arms each of which contains at least one switch device, and external switch circuitry for controlling the said switch devices, the four arms of said bridge network comprising two pairs of opposite arms each of which is selectively capable of forming a conducting path between said input and said output under the control of said external switch circuitry, said external switch circuitry being operative to switch the switch devices contained in each pair of opposite arms from a nonconducting state to a conducting state and from a conducting state to a nonconducting state at least once during every half period of said single phase to provide at said output a voltage waveform which contains a fundamental component of the said single phase which is out of phase with the single phase by a predetermined phase angle.

3,959,710

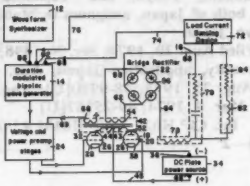
METHOD FOR EXCITING INDUCTIVE-RESISTIVE LOADS WITH HIGH AND CONTROLLABLE DIRECT CURRENT

Homer M. Hill, Jr., Princeton Junction, N.J., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 31, 1974, Ser. No. 537,809

Int. Cl.² H02M 1/12

U.S. Cl. 321—9 A **4 Claims**



1. Power transmitting apparatus for the use with a waveform synthesizer source of a changing dc voltage amplitude corresponding to a desired load circuit current, comprising:

a. load circuit means;

b. rectangular wave ac carrier generator means;

c. power transmitting push-pull amplifier means having a transformer characterized by a predetermined turns ratio and a rectifier for transmitting the ac carrier in the form of rectified rectangular wave pulses to the load circuit means from the rectangular wave generator; and

d. means for duration modulating the ac carrier to effect the transmission of the rectified rectangular wave pulses to the load circuit means in accordance with the changing dc voltage amplitude;

e. the power transmitting push-pull amplifier means being matched to the resistive part of the load circuit means by the turns ratio of the transformer.

3,959,711

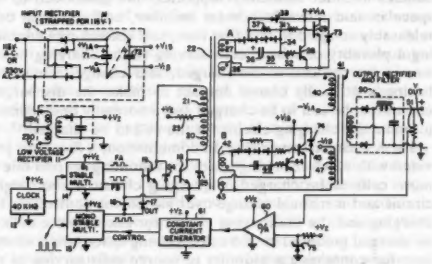
PULSE WIDTH MODULATED POWER SUPPLIES

Frank E. Greenhalgh, Amityville, N.Y., assignor to Technology Development Corporation, Dayton, N.J.

Filed Dec. 9, 1974, Ser. No. 530,736

Int. Cl.² H02M 1/08

U.S. Cl. 321—18 **8 Claims**



1. A switching power supply of the type providing a DC output signal indicative of the average value of a repetitive waveform produced by said switching power supply, comprising:

a. a first and second transistor, each having a base, collector and emitter electrode,

b. a source of biasing potential having at least two output terminals of opposite polarity coupled between said base to collector electrodes of said first and second transistors for biasing the same,

c. driving means coupled between said base electrodes of said first and second transistors for causing one to conduct while the other is non-conducting and vice versa, to provide a first waveform of a given repetition rate and polarity at said first collector electrode, and a second waveform of the same rate and opposite polarity at said second collector electrode, said driving means including a source of a relatively stable frequency, means coupled to said source for providing first and second output signals of opposite phase and of a frequency relatively equal to one-half of said stable frequency, said first output signal applied to said base electrode of said first transistor and said second output signal applied to said base electrode of said second transistor,

d. switch through means including an adjustable triggerable pulse source having an input terminal coupled to said stable frequency source and an output terminal for providing a pulse train at a frequency relatively equal to said stable frequency, said output terminal coupled to said base electrodes of said first and second transistors to cause both to conduct in the same mode during the presence of said pulse, and

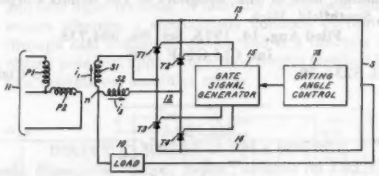
e. means coupled to said triggerable pulse and responsive to said average value of said DC output signal for varying the width of said pulse relatively independent of said stable frequency.

3,959,712

PHASE CONVERTER

Fred W. Kelley, Jr., Media, Pa., and Georges R. E. Lezan, Cherry Hill, N.J., assignors to General Electric Corporation, Phila, Pa.

Filed Dec. 18, 1974, Ser. No. 534,054
Int. Cl.² H02M *5/257*
U.S. Cl. 321—56 **6 Claims**



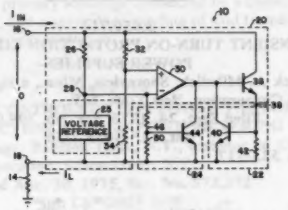
1. Electric phase conversion apparatus for connecting a single phase electric load to a polyphase alternating current power supply circuit of N phases without change in frequency or unbalance of polyphase current or voltage which comprises, means for deriving from said supply circuit KN phase voltage sources in polyphase relation with phase voltages sequentially displaced in phase by 180/KN electrical degrees where K is an integral number, a pair of single phase load circuit terminals, a semiconductor bridge network including positive and negative network bus conductors and KN pairs of gate controlled semiconductor devices, the semiconductor devices of each said pair of devices connecting one terminal of each said phase voltage source selectably to said positive or negative network bus conductors, a spanning connection conductively connecting together said positive and negative bus conductors, means connecting said load circuit terminals between said spanning connection and the other terminal of each said phase voltage sources, and phase controlled gating means for sequentially triggering each said semiconductor device at power circuit frequency to conduct for equal intervals during each half cycle of phase voltage sequentially applied to said devices in conductive polarity.

3,959,713

SOLID STATE CURRENT LIMIT CIRCUIT

Walter Richard Davis, and Tim Warren Henry, both of Tempe, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Mar. 27, 1975, Ser. No. 562,693
Int. Cl.² G05F *1/58*
U.S. Cl. 323—9 **12 Claims**



8. A current limit circuit suitable to be manufactured in monolithic integrated circuit form and having an input terminal and an output terminal and adapted to be connected in series between a power supply and a load, the current limit circuit being adapted to limit the current supplied to the load to a predetermined maximum value in response to a current overload condition, comprising:

first amplifier means having a first and second input terminal, a common terminal and an output terminal said common terminal being connected to a constant current source;

first voltage reference means for generating a substantially constant voltage in response to the power supply and having first and second terminals and an ouput terminal, said first and second terminals being connected between the input and output terminals, respectively, of the current limit circuit, and said output terminal being connected to said first input terminal of said first amplifier means;

second voltage reference means responsive to the voltage developed thereacross for supplying a voltage level to said first amplifier means and having a first and a second input terminal and an output terminal, said first and second input terminals being connected to the input and output terminal of the current limit circuit respectively and said output terminal being connected to said second input terminal of said first amplifier means;

second amplifier means for providing negative feedback to said first amplifier means to maintain the voltage generated across the input and output terminals of the current limit circuit substantially constant and for providing a current to the load having an input terminal connected to said output terminal of said first amplifier means, first and second output terminals, said first output terminal being connected to the input terminal of the current limit circuit, and including at least one electron control means having a control electrode, a first electrode, and a second electrode, said control electrode being connected to said input terminal of said second amplifier means, said first electrode being coupled to said second output terminal of said second amplifier means and said second electrode being coupled to said first output terminal of said second amplifier means;

current limiting means operatively connected between said input terminal and said second output terminal of said second amplifier means and the output terminal of the current limit circuit for limiting the current supplied to the load to a predetermined maximum value in response to the current overload condition;

thermal responsive means operatively connected between said output and first input terminal of said first amplifier means and the output terminal of the current limit circuit and being rendered operative when the temperature of

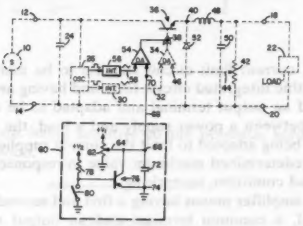
the current limit circuit becomes greater than a predetermined magnitude in response to the current overload condition for reducing the current supplied to the load to a minimum value, said thermal responsive means being periodically rendered inoperative and then operative once again until such time that the current overload condition may be converted.

3,959,714

TRANSIENT TURN-ON PROTECTION CIRCUIT FOR POWER SUPPLIES

Frederick A. Mihelich, Shoreview, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Sept. 24, 1973, Ser. No. 399,907
Int. Cl.² G05F *1/56*
U.S. Cl. 323—17 **4 Claims**



1. In a switching transistor type voltage regulator circuit wherein a semiconductor switch is used to connect an unregulated voltage source to a load and wherein means are provided for comparing a feedback signal proportional to the output voltage to a preset reference and producing first control pulses for turning on the semiconductor switch whenever said feedback signal is less than said preset reference, the improvement comprising:

a. means for producing second control pulses of successively increasing pulse duration a predetermined time following said initial energization of said regulator circuit; and

b. means for logically combining said first control pulses and said second control pulses such that said semiconductor switch is turned on only when said first and second control pulses are of a predetermined binary significance.

3,959,715

AUTOMATIC CONTROLLER FOR ELECTROSTATIC PRECIPITATOR

Bernard Canning, Birmingham, England, assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 415,592, Nov. 14, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 512,575
Claims priority, application United Kingdom, Nov. 16, 1972, 52912/72
Int. Cl.² B03C *3/68*
U.S. Cl. 323—19 **4 Claims**

1. An automatic voltage controller for use in maintaining the maximum electrode potential in an electrostatic precipitator, the controller comprising:

a digital store;

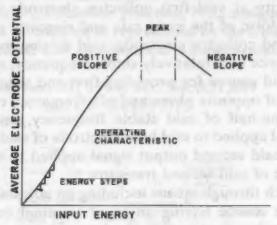
means responsive to the count in the store for providing an output signal for controlling the electrode potential;

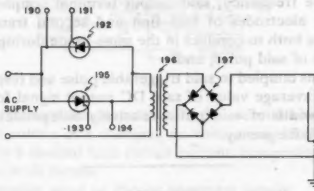
means for establishing alternating raise and lower periods in the operation of the controller;

a pulse source;

means for gating a specified number of pulses from said pulse source to the store during each raise period to increase the store count and thereby the electrode potential; and

means responsive to a signal indicative of falling electrode potential for gating a specified number of pulses from said





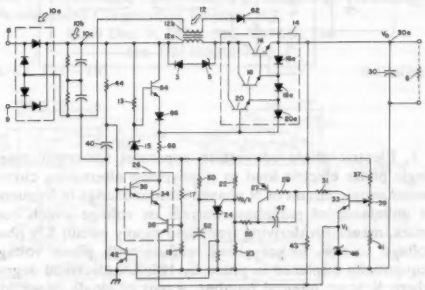
pulse source to the store during each lower period to reduce the store count and thereby the electrode potential.

3,959,716

WIDE INPUT RANGE SWITCHING VOLTAGE REGULATOR

Gerard B. Gilbert, Jr., Baltimore, and Robert E. McMorran, Timonium, both of Md., assignors to The Bendix Corporation, Southfield, Mich.

Filed Aug. 14, 1975, Ser. No. 604,735
Int. Cl.² G05F *5/00*
U.S. Cl. 323—20 **3 Claims**



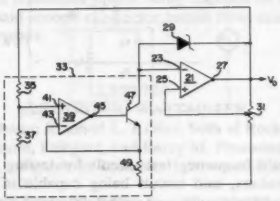
1. A voltage regulator circuit comprising: a pair of input terminals between which an unregulated voltage is applied, and a pair of output terminals across which a regulated voltage is generated; a capacitive reactance connected across said output terminals; an inductive reactor; switch means serially connected with said inductive reactor between a first of said input terminals and a first of said output terminals; a source of a reference voltage level; means for generating a ramping voltage signal on a slope determined by the level of said unregulated voltage; means for controlling said switch means in accordance with the level of said ramping voltage signal with respect to said reference voltage level; means for returning said ramping voltage signal to a base level when triggered;

means for generating a second ramping voltage signal on a slope determined by said regulated voltage; and, means responsive to said second ramping voltage signal and said regulated voltage for triggering said means for returning.

3,959,717
TEMPERATURE STABILIZED VOLTAGE REFERENCE CIRCUIT

Ira Jay Pitel, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed July 9, 1975, Ser. No. 594,277
Int. Cl.² G05F *3/14*
U.S. Cl. 323—22 Z **8 Claims**



1. A temperature stabilized voltage reference circuit comprising:

first operational amplifier means having first and second input terminals and an output terminal;

first resistor means connecting said output terminal to said second input terminal of said first operational amplifier means to effect stabilized operation thereof;

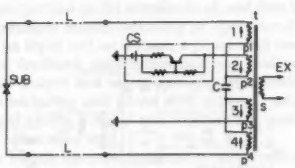
voltage to current converter means including a second operational amplifier means coupled to a current source means, said voltage to current converter means coupled to said output terminal and said first input terminal of said first operational amplifier means; and

an avalanche device means coupled to said output terminal and first input terminal of said first operational amplifier means whereby a substantially constant current flows through said avalanche device and is a function of the output potential appearing at said output terminal of said first operational amplifier means.

3,959,718
DIRECT CURRENT SUPPLY SOURCE

Kiyoshi Hasegawa, Tokyo, Japan, assignor to Oki Electric Industry Company, Ltd., Tokyo, Japan

Filed June 3, 1974, Ser. No. 475,982
Claims priority, application Japan, June 15, 1973, 48-66942
Int. Cl.² G05F *7/00*
U.S. Cl. 323—48 **1 Claim**



1. A method for supplying a direct current from a current source through a transformer having four primary windings and a transmission line to a communication terminal device comprising the steps of;

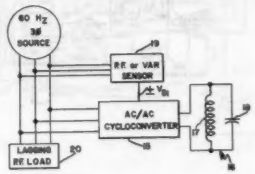
a. flowing a direct current in a circuit from one end of the current source through the beginning of a second primary winding, the end of the second primary winding, the end of the first primary winding, the beginning of the first primary winding, the transmission line, the communication terminal device, the transmission line, the end of the fourth primary winding, the beginning of the fourth primary winding, the beginning of the third primary winding, and the end of the third winding, to the other end of the current source,

b. transmitting an alternate current from the communication terminal device through the transmission line, first and fourth primary windings connected by a capacitor to each other, and a secondary winding of said transformer, to an electronic exchange.

3,959,719
STATIC CONTROLLER FOR POWER FACTOR CORRECTION AND ADAPTIVE FILTERING

Paul M. Espelage, Ballston Lake, N.Y., assignor to General Electric Corporation, Schenectady, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,372
Int. Cl.² G05F *5/00*
U.S. Cl. 323—102 **11 Claims**



1. A static reactive power controller comprising

a polyphase cycloconverter circuit connected in cascade with a high frequency resonant tank circuit effectively comprised by an inductor and capacitor in parallel, said cycloconverter circuit having in each phase an input filter including a series filter inductor connectable to a source of low frequency line voltage, and

control means for controlling said cycloconverter to produce real power flow to said resonant tank only approximately sufficient to supply the static controller losses while selectively producing a variable amount of leading and lagging reactive power as determined by the polarity and magnitude of a system control signal representative of a system quantity to be controlled.

3,959,720
VOLTAGE CONTROL SYSTEM FOR HIGH FREQUENCY LINK CYCLOCONVERTER

Bimal K. Bose, Troy, and Paul M. Espelage, Ballston Lake, both of N.Y., assignors to General Electric Corporation, Schenectady, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,373
Int. Cl.² G05F *5/00*
U.S. Cl. 323—102 **19 Claims**

1. A cycloconverter system comprising

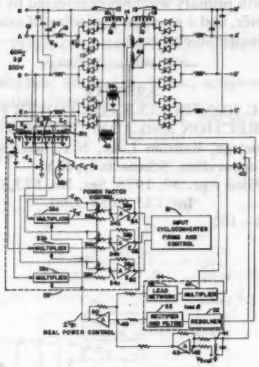
a polyphase cycloconverter circuit in cascade with a high frequency resonant tank circuit and having in each phase an input series filter inductor connectable to a source of low frequency line voltage,

voltage sensor means for sensing the instantaneous tank voltage and deriving a sensor signal indicative thereof, and

a control circuit for controlling said cycloconverter to maintain the tank voltage within predetermined limits for both directions of power flow,

said control circuit including phase and amplitude shifter means for generating per phase cycloconverter reference signals for controlling at least the real power component and direction of power flow through the cycloconverter in dependence upon the magnitude and polarity of a real

power control signal, means for comparing said tank voltage sensor signal to a reference voltage and generating a tank voltage error signal used at least as the main



component of the real power control signal, and firing and control means actuated by said cycloconverter reference signals for controlling said cycloconverter to maintain the tank voltage within the predetermined limits.

3,959,721

METHOD EMPLOYING D.C. PULSES FOR THE DETECTION OF DISSEMINATED OR MASSIVE MINERALIZATION WITHIN THE EARTH CRUST BY PRODUCING AN A.C. ELECTROMAGNETIC FIELD

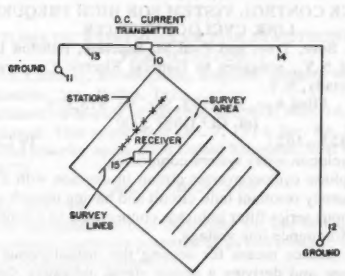
John Roschuk, 329 Rouge Road, and Merrick Holden, 321 Ashland Ave., both of Winnipeg, Manitoba, Canada

Filed June 19, 1974, Ser. No. 480,889

Claims priority, application United Kingdom, June 25, 1973, 30098/73

Int. Cl.² G01V *3/08, 3/10*

U.S. Cl. 324—6 **4 Claims**



4. A method for the detection of disseminated and massive mineralization within the earth's crust comprising the steps of inducing at least one primary D.C. pulse into the zone being surveyed, and measuring the alternating current electromagnetic field set up by said at least one pulse within a mineralized zone within the zone being surveyed so as to determine the presence of disseminated and/or massive mineralization within the zone being surveyed.

3,959,722

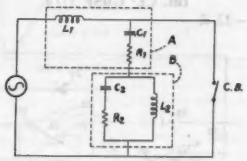
INTEGRATED CIRCUIT FOR CONTROL OF THE TRANSIENT RECOVERY VOLTAGE IN DIRECT AND SYNTHETIC TESTING OF HIGH VOLTAGE CIRCUIT BREAKERS

Vojislav Narancic, Montreal, Canada, assignor to Institut de Recherches de l'Hydro-Quebec (IREQ), Varenne, Canada

Filed Nov. 18, 1974, Ser. No. 524,661

Int. Cl.² G01R *31/02*

U.S. Cl. 324—28 CB **8 Claims**



1. A multi-frequency test circuit for testing high voltage circuit breakers, said circuit being capable of providing a transient recovery voltage of a predetermined form to test the breaking capacity of circuit breakers, said test circuit comprising

a high voltage A.C. source;

a first multi-parameter network for producing low frequency components of said transient recovery voltage, said first network being constituted of a first inductance connected in series between said source and a circuit breaker, a capacitance-resistance unit connected to the output of said first inductance;

a second multi-parameter network for producing high frequency components of said transient recovery voltage, said second network including a second inductance in parallel with a second resistance serially connected to a second capacitance and being connected in series with said first unit, the second network and the unit being connected across the terminals of said circuit breaker, whereby a transient recovery voltage waveform for testing the breaking capacity of the circuit breaker is produced.

3,959,723

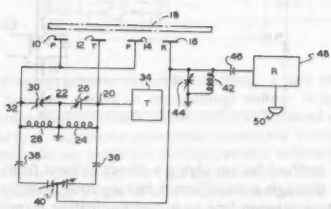
LUMBER MOISTURE MEASUREMENT APPARATUS WHICH IS LESS SENSITIVE TO LUMBER MOVEMENT AND SPACING

Delmer W. Wagner, 392 Pine Grove Road, Rogue River, Oreg. 97537

Filed Sept. 13, 1974, Ser. No. 505,850

Int. Cl.² G01R *27/26*

U.S. Cl. 324—61 P **8 Claims**



1. Apparatus for measuring the moisture content of material, said apparatus comprising:

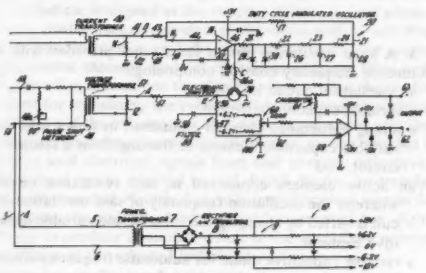
first conductor means disposed in facing relation to said material,

second conductor means disposed in facing relation to said material,
and third conductor means disposed in facing relation to said material,
radio frequency generator means coupled for energizing said first and second conductor means in predetermined out of phase relation,
and means responsive to the field at said third conductor means for indicating moisture in said material,
wherein said first, second and third conductor means comprise an array which includes a said first conductor means a said second conductor means and a said third conductor means disposed in order and in offset relation to one another, while being in spaced relation to said material, said third conductor means being disposed on the remote side of said second conductor means from said first conductor means.

3,959,724
ELECTRONIC WATTMETER

Maghar S. Chana; Ramond L. Kraley, both of Rochester; Eric A. Hauptmann, Fairport, and Barry M. Pressman, Penfield, all of N.Y., assignors to Rochester Instrument Systems, Inc., Rochester, N.Y.

Filed July 22, 1974, Ser. No. 490,787
Int. Cl.² G01R *7/00, 11/32;* **G06G** *7/161;* **H03K** *1/18*
U.S. Cl. 324—142 **13 Claims**

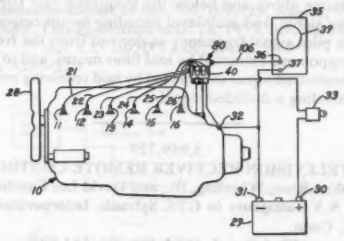


1. A transducer circuit to monitor two alternating waveforms, for example, one being of current and other voltage for use in the linear and accurate measurement of electrical power, said circuit comprising
first means to monitor said first waveform,
second means to monitor said second waveform,
a modulator means connected to said first means, said modulator means being an oscillator whose frequency is nominally independent of said first waveform but whose output pulse varies in its duty cycle zero crossings in direct proportion to the amplitude of said first waveform, said modulator means including an operational amplifier having an input and an output, a phase-shift means and a negative feedback connection between said operational amplifier output and input, said negative feedback connection including said phase shift network, said modulator means having a linear and constant a.c. gain although its d.c. offset may vary,
electronic switch means connected to and controlled as to switching by said modulator and connected to said second monitor means and having an output, said switch means being switched between the conducting and nonconducting states during each of the zero crossings by said modulator, whereby the output of said switch is a train of pulses whose amplitude is directly proportional to the amplitude of said second waveform and whose duty cycle zero crossing timing is directly proportional to the amplitude of said first waveform and whose frequency is nominally constant,
filter means connected to the switch output to produce a direct current signal, said direct current signal being proportional to said electrical power,
whereby said direct current signal is not dependent upon the symmetry of the modulator output and therefore may be substantially independent of adverse aging and temperature effects.

3,959,725
DISTRIBUTOR VOLTAGE SENSOR

William J. Capek, Bridgeview, Ill., assignor to Sun Electric Corporation, Chicago, Ill.

Filed Apr. 29, 1974, Ser. No. 465,123
Int. Cl.² G01R *13/42*
U.S. Cl. 324—16 S **6 Claims**



1. In a system for testing an internal combustion engine ignition system including a source of common potential, a plurality of fuel ignitors and a distributor including a housing for distributing voltage pulses to the fuel ignitors, said distributor including within the housing a primary coil, means for starting and terminating the flow of electrical current through the primary coil in synchronism with the engine, and a secondary coil magnetically coupled to the primary coil for generating the voltage pulses distributed to the ignitors, improved apparatus for displaying the waveform of the voltage produced by the secondary coil comprising:
an oscilloscope having a first input and a second input;
a conductive sensor;
means for positioning and maintaining the conductive sensor within a predetermined distance of less than two inches from the secondary coil;
a first conductor for operatively connecting the sensor to the first input of the oscilloscope; and
a capacitor electrically connected between the first conductor and the source of common potential, whereby the waveform of the voltage produced by the secondary coil is displayed on the oscilloscope.

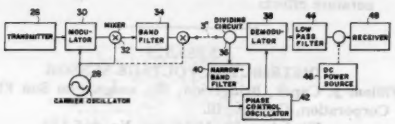
3,959,726
PILOT SIGNAL TRANSMISSION SYSTEM

Shigehiko Hinoshita, Yokohama, and Shoji Hagiwara, Tokyo, both of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Filed Sept. 18, 1972, Ser. No. 289,601
Claims priority, application Japan, Sept. 18, 1971, 46-72781; Nov. 13, 1971, 46-91000
Int. Cl.² H04B *1/68*
U.S. Cl. 325—38 A **15 Claims**

1. A transmission system utilizing a pilot signal comprising:
a. transmission means for transmitting a multilevel amplitude digital signal with a pilot signal imposed thereon to receiving means;
b. said transmission means including means for providing a clocking signal establishing a symbol rate f_s, means receiving a binary input information signal and responsive to the clocking signal for producing a multilevel amplitude digital signal output, and means responsive to the symbol rate fs of the clocking signal for producing the

pilot signal at a frequency rate *fs*/N (where N = 2, 3, 4, . . .) and for coupling the pilot signal to the multilevel amplitude signal in in-phase relationship thereto for developing the multilevel digital signal to be transmitted; and



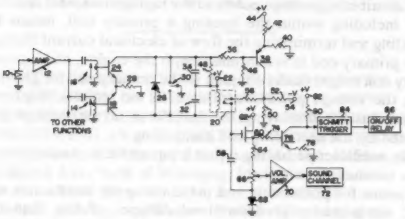
c. said receiving means comprising filter means for extracting the frequency components of the transmitted signal in a range above and below the frequency rate *fs*/N of the pilot signal, and multilevel decoding means responsive to the pilot signal frequency as derived from the frequency components extracted by said filter means, and to the said transmitted signal as received by said receiving means, for providing a decoded signal.

3,959,727

TELEVISION RECEIVER REMOTE CONTROL

Dong Woo Rhee, Wheeling, Ill., and David Lee Funston, Batavia, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 3, 1974, Ser. No. 511,596
Int. Cl.² H04B *1/06*
U.S. Cl. 325—390 **2 Claims**



1. A remote control receiver for a television receiver comprising:

first and second frequency detectors;

first and second voltage sources of first and second polarities, respectively;

a capacitor for storing a charge representative of a desired operating point;

a relay with a winding, a first contact connected to said capacitor, and a second contact connected to said first voltage source of said first polarity;

a transistor connected to said second voltage source of said second polarity and to said second contact of said relay for connecting said second voltage source to said second contact;

means connecting said first and second frequency detectors to said winding for closing said first and second contacts in response to signals from either of said first and second frequency detectors and

connecting said second frequency detector to said transistor for reversing the polarity of the voltage at said second contact in response to a signal from said second frequency detector for charging and discharging said capacitor;

a field-effect transistor having gate and source electrodes with said capacitor effectively connected between said gate and source electrodes for sampling the charge stored by said capacitor; and

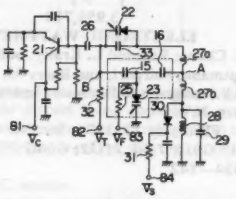
a diode connected in series with said capacitor for limiting the potential of said gate electrode during one of the charging and discharging operations for preventing said field-effect transistor from being driven beyond cut-off.

3,959,728

LOCAL OSCILLATION CIRCUIT FOR TUNER HAVING REDUCED INTER-CHANNEL DEVIATION IN AFC SENSITIVITY

Kazuhiko Yamazaki, Fujisawa; Takeshi Saitoh, and Yoshio Miura, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 15, 1975, Ser. No. 541,114
Claims priority, application Japan, Jan. 18, 1974, 49-7919; June 5, 1974, 49-62954
Int. Cl.² H03B *3/04*; H04B *1/16*
U.S. Cl. 325—422 **4 Claims**



3. A local oscillation circuit for a tuner provided with an automatic frequency control, comprising:

an oscillation circuit including

a variable capacitive element,

a tuning inductance element connected in series with said variable capacitive element to thereby form a resonance circuit, and

an active element connected to said resonance circuit, whereby the oscillation frequency of said oscillation circuit is varied by changing the value of said variable capacitive element;

a variable capacitive diode for automatic frequency control having a first terminal connected to a reference potential and a second terminal;

a first coupling capacitor connected between said second terminal of said variable capacitive diode and one electrode of said variable capacitive element of said resonance circuit;

a second coupling capacitor connected between said second terminal of said variable capacitive diode and the other electrode of said variable capacitive element of said resonance circuit; and

means, connected to said variable capacitive diode, for applying a control voltage to said variable capacitive diode, so that the oscillation frequency of said oscillation circuit is controlled for a reception of a desirable signal by said tuner.

3,959,729

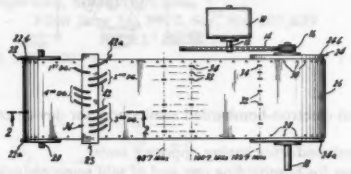
ELECTRO-OPTIC TUNING INDICATOR

John A. Marchetti, Staten Island, N.Y., assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 25, 1974, Ser. No. 454,301
Int. Cl.² H04B *1/06*
U.S. Cl. 325—455 **6 Claims**

1. A tuning indicator for a receiver tunable to one of a plurality of radio frequency signals transmitted from a selected distant broadcast station comprising a segmented bar digital display mounted on the receiver housing for viewing by the user of the receiver, a station encoder having encoded thereon in binary form a plurality of sets of station indicia representative of the carrier frequency of said selected broad-

cast station and a plurality of alignment indicia with an alignment index cooperatively arranged on said station encoder with each set of station indicia, means mounting said station encoder for movement of said sets of station indicia and associated alignment indicia to a reading station in the receiver as the receiver is tuned, an optical reader positioned at the reading station in the receiver including first and second light sources and a fiber optic bundle positioned on opposite sides of said station encoder, said fiber optic bundle having its proximal end terminating at said reading station for alignment with said sets of indicia and associated alignment indicia, first photoelectric device means including input means oriented at the distal end of said fiber optic bundle to receive light transmitted from said first light source through an alignment index and said fiber optic bundle and output means coupled to said

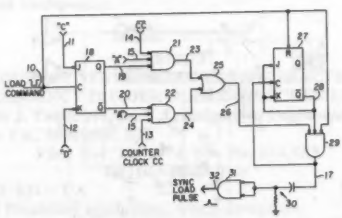


second light source for converting said received light into a signal to activate said first light source when said at least one set of indicia is aligned at the reading station, second photoelectric device means oriented at the distal end of said fiber optic bundle to receive light transmitted from said second light source through said set of indicia and said fiber optic bundle when at least one set of indicia is aligned at the reading station for translating the received light into electrical signals indicative of the information encoded on said station encoder, electrical decoding means including input means coupled to receive said electrical signals from said photoelectric device and output means coupled to said digital display for translating said encoded electrical signals into electrical signals for activating the individual bars of said segmented bar digital display to produce a number visible to the user of the receiver indicative of the selected broadcast station.

3,959,730
DIGITAL HYSTERESIS CIRCUIT

Charles A. Weber, Marion, and Michael W. Lundgren, Esterville, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 16, 1974, Ser. No. 506,483
Int. Cl.² H03K *1/17, 19/08*
U.S. Cl. 328—63 **8 Claims**

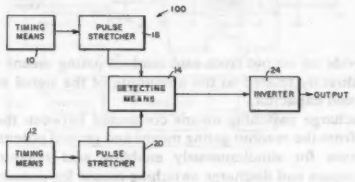


1. Pulse generating means comprising a clock pulse train, a source of load command pulses asychronous with said clock pulse train, a waveform generator receiving said clock pulse train as input thereto, said waveform generator comprising means to generate first and second gating pulse trains, said first gating pulse train comprising pulses time coincident with a predetermined portion of successive first half-cycles of said clock pulse train, said second gating pulse train comprising pulses time coincident with like predetermined portions of successive second half-cycles of said clock pulse train, and logic gating means receiving said first and second gating pulse trains and said load command pulses as inputs thereto and developing an output pulse the time occurrence of which is defined by the time occurrence of a predetermined one of said first and second gating pulse train pulses generated subsequent to the time occurrence of said load command pulse.

3,959,731
METHOD OF PROVIDING LONG TIME INTERVALS BETWEEN OUTPUTS OF A TIMING MEANS

Daniel I. Pomerantz, Lexington, and David O. Veinot, Arlington, both of Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 169,729, Aug. 6, 1971, abandoned. This application Mar. 14, 1973, Ser. No. 341,042
Int. Cl.² H03D *13/00;* **H03K** *5/13*
U.S. Cl. 328—129 **5 Claims**



1. A method of providing long time intervals comprising:
a. producing a first series of output pulses at T_1 time intervals and of t_1 duration,
b. producing a second series of output pulses at T_2 time intervals and of t_2 time duration, T_2 being less than T_1, and the sum of t_1 and t_2 being greater than the difference between T_1 and T_2, said series of output pulses starting substantially simultaneously, and
c. detecting both said series of output pulses and providing outputs at time intervals

$$T = \frac{T_1 \cdot T_2}{T_1 - T_2}$$

when said series of output pulses coincide.

3,959,732
SIGNAL PROCESSING SYSTEM AND METHOD

Louis F. Schaefer, Palo Alto, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed July 22, 1974, Ser. No. 491,158
Int. Cl.² H03K *9/02, 1/14*
U.S. Cl. 328—151 **13 Claims**

1. In a system for use in processing an amplitude modulated carrier signal such as a signal produced by an ultrasonic transducer element, or the like, included in an array of such elements:
amplifier means having an output and an input to which an amplitude modulated carrier signal is connected;
an envelope detector comprising rectifier and low pass filter means connected to the amplifier means output;
signal storage means;
signal gating means operable between enabled and disabled conditions for connecting the output from said envelope detector to said signal storage means when enabled; said signal gating means being recurrently enabled for time periods which extend over a plurality of cycles of said carrier signal;
said signal storage means consisting of a capacitor which is charged according to the magnitude of the output from

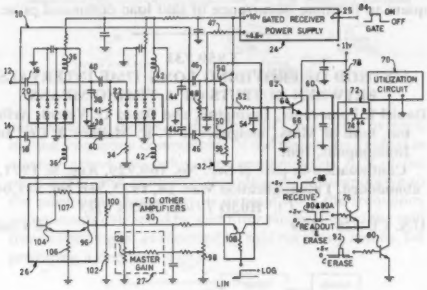
said envelope detector during the enabled condition of said signal gating means;

means including readout gating means connected to said capacitor for connecting said capacitor to a utilization circuit when said signal gating means is disabled;

means for enabling said readout gating means for a time during which said signal gating means is disabled to provide an output from said readout gating means which is directly related to the amplitude of the signal stored by said capacitor;

discharge switching means connected between the output from the readout gating means and ground potential; and

means for simultaneously enabling said readout gating means and discharge switching means for connecting the output from the capacitor to ground potential.



3,959,733

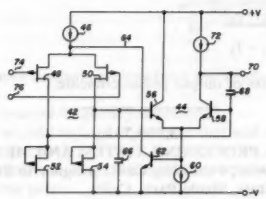
DIFFERENTIAL AMPLIFIER

James E. Solomon, Saratoga, and Ronald W. Russell, Sunnyvale, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 12, 1975, Ser. No. 549,194

Int. Cl.² H03F *3/45*

U.S. Cl. 330—30 D **5 Claims**



1. A differential amplifier comprising

a. an input amplifier stage including

1. a current source,

2. a first pair of transistors connected to said current source and having one electrode of each forming the inputs of said differential amplifier, and

3. a second pair of transistors each connected as current source loads for a respective one of said first pair of transistors,

b. a third pair of transistors connected as a differential pair to the output of said input stage, and

c. means for drawing current from said current source and responsive to a voltage change at the inputs of said third pair of transistors for changing the amount of current drawn from said current source, such that said current drawing means removes all of the current supplied by said current source which is not drawn by said first pair of transistors.

3,959,734

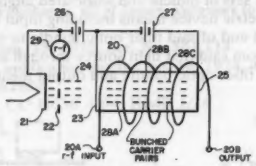
ELECTRON-BEAM-BOMBARDED, SEMICONDUCTOR, TRAVELING-WAVE DEVICE

Arthur H. Gottfried, Rumson, and John J. Tancredi, Neptune, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 14, 1975, Ser. No. 604,739

Int. Cl.² H03F *3/58*

U.S. Cl. 330—33 **9 Claims**



1. An electron-bombarded semiconductor device comprising:

a semiconductor having opposing ends;

means for bombarding one end of said semiconductor with a stream of electrons to produce carrier pairs within said semiconductor proportional to said bombarding electrons;

means for modulating said stream of electrons bombarding said semiconductor to modulate said carrier pairs;

means for drawing said modulated carrier pairs along an axis of said semiconductor from said one end to the other end at a given rate;

conducting means positioned adjacent to said semiconductor, said conducting means being wound to progress uniformly in the direction of said axis of said semiconductor;

an output circuit; and

means for connecting said output circuit to one end of said conducting means, whereby said bunched carrier pairs traveling along said axis of said semiconductor will induce signals in said conductor that travel in the direction of said axis of said semiconductor at said given rate.

3,959,735

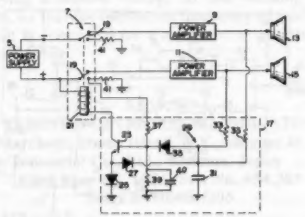
LOUDSPEAKER AND AMPLIFIER PROTECTION CIRCUIT

Jon Paul GrosJean, Batavia, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 16, 1975, Ser. No. 587,038

Int. Cl.² H03F *21/00*

U.S. Cl. 330—207 P **12 Claims**



1. In a signal receiver having a potential source and an amplifier stage coupled to a loudspeaker, a loudspeaker and amplifier stage protection circuit comprising:

a switching means including a normally closed contact arm coupling said potential source to said amplifier stage;

means coupled to the output of said amplifier stage and to said loudspeaker for filtering an AC potential;

means coupled to said means for filtering an AC potential for coupling positive and negative polarity DC potentials; and

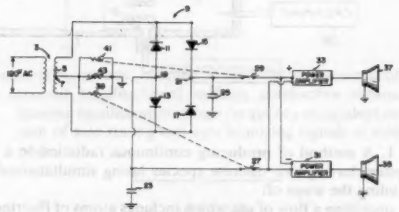
means connected to said means for coupling positive and negative DC potentials and to said switching means for activating said switching means to disconnect said potential source from said power amplifier in response to the appearance of a DC potential at the output of said amplifier stage.

3,959,736

LOUDSPEAKER PROTECTION CIRCUIT

Jon Paul GrosJean, Batavia, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 16, 1975, Ser. No. 587,039
Int. Cl.² H03F *21/00*
U.S. Cl. 330—207 P **7 Claims**



5. In a signal receiver having an AC potential source including a center-tap transformer shunted by a full-wave bridge rectifier to provide a pair of DC output potential terminals and a plurality of power amplifier stages each directly coupled to a loudspeaker connected to a potential reference level, a power amplifier and loudspeaker protection circuit comprising:

thermal relay means associated with each one of said DC output potential terminals, each of said thermal relay means including a normally closed contact coupling said DC output potential terminals to said power amplifier stages and a heater coupled to said center-tap of said transformer and to said potential reference level; and

impedance means coupling said center-tap of said transformer to said potential reference level for developing a potential to effect activation of said relay means and disconnection of said power amplifier from said DC output potential terminals upon increased current flow in said loudspeaker.

3,959,737

FREQUENCY SYNTHESIZER HAVING FRACTIONAL FREQUENCY DIVIDER IN PHASE-LOCKED LOOP

William J. Tanis, Wayne, N.J., assignor to Engelmann Microwave Co., Montville, N.J.

Filed Nov. 18, 1974, Ser. No. 524,533
Int. Cl.² H03B *3/04*
U.S. Cl. 331—1 A **7 Claims**

1. A frequency synthesizer, which comprises:

a voltage-tuned oscillator, the output frequency of which is monotonically related to a d.c. potential applied to the tuning port thereof;

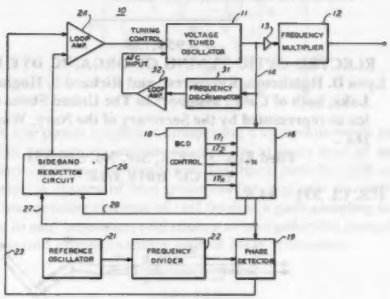
a digital divider connected to the output of said voltage-tuned oscillator, said digital divider dividing the output frequency of said voltage-tuned oscillator by a factor of N, where N is any integer or fractional number greater than unity;

means connected to said digital divider, for altering the value of said factor N;

a source of a reference frequency signal;

means connected to the output of said digital divider and to said source of a reference signal, for comparing the phase of said reference frequency signal with the phase of the divided output of said voltage-tuned oscillator, thereby to generate an error signal if there is any difference in phase; and

means for supplying said error signal to the tuning port of said voltage-tuned oscillator whereby said oscillator alters its output frequency, and hence the output frequency of



the synthesizer, in an offsetting manner to reduce said error signal towards zero;

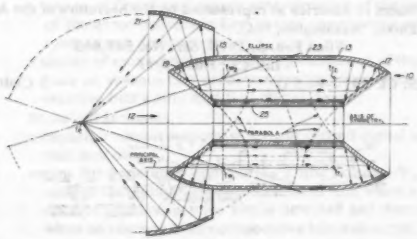
wherein said digital divider produces an unwanted ramp signal which tends to produce spurious sidebands in the output of said voltage-tuned oscillator, and said synthesizer further comprises a sideband reduction circuit having an input connected to the output of said digital divider and an output connected to said supplying means, said sideband reduction circuit generating a ramp signal of similar frequency, amplitude and shape to said unwanted ramp signal, but of opposite phase, whereby said unwanted ramp signal is canceled in said supplying means.

3,959,738

LASER

Werner R. Rambauske, Carlisle, and Philip J. McFarland, Lynnfield, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed June 3, 1974, Ser. No. 475,356
Int. Cl.² H01S *3/081*
U.S. Cl. 331—94.5 C **5 Claims**



1. In a laser incorporating an optical cavity wherein stimulated radiation at a selected wavelength is subjected to constructive interference to render such radiation coherent after a plurality of reflections between a pair of end walls of such cavity, an improved optical cavity comprising:

a. a partially reflective mirror disposed to operate as one end wall of an optical cavity, the reflecting surface of such mirror being concave and corresponding to the shape generated by rotating a minor arc of a first circle about an axis of symmetry of the optical cavity;

b. a first convex mirror disposed within the optical cavity, the reflecting surface of such first convex mirror being positioned between the partially reflective mirror and the axis of symmetry of the optical cavity, such reflecting surface corresponding to the shape generated by rotating a portion of a first parabola about the axis of symmetry of the optical cavity, the focal point of the first parabola being coincident with the center of curvature of the minor arc of the first circle.

3,959,739

ELECTRO-OPTIC TUNING OF ORGANIC DYE LASER

Lynn D. Hutcheson, Ridgecrest, and Richard S. Hughes, China Lake, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 3, 1975, Ser. No. 546,651
Int. Cl.² H01S *3/10*
U.S. Cl. 331—94.5 C **5 Claims**

1. An electro-optic laser tuning system, comprising:

a laser cavity including a lasing cell, and bounded at one end by a laser output mirror;

reflecting means at the opposite end of said cavity for retrogressively reflecting those wavelengths that are incident thereon at the retrogressive angle unique to each wavelength; and

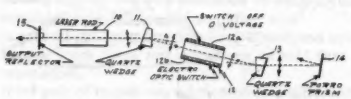
laser beam deflecting means in said cavity and in the optical path between said cell and said reflecting means for electro-optically tuning the laser to oscillate at selected wavelengths in response to an electrical signal, including an electro-optic, beam deflection cell comprising a plurality of like members in contact, each having axial properties and a first, second and third axis, with the first axis of the first of said members oppositely oriented to the first axis of the second of said members.

3,959,740

QUARTZ WEDGE POLARIZER FOR AN ELECTRO OPTIC SWITCH

Donald R. Dewhirst, Torrance, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 6, 1975, Ser. No. 547,663
Int. Cl.² H01S *3/11*
U.S. Cl. 331—94.5 Q **3 Claims**



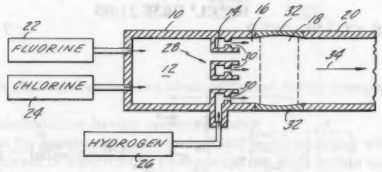
1. A laser Q-switch being comprised of an optical cavity having first and second laser mirrors and including therebetween, in the recited sequence, a laser medium for emitting a laser beam, a first crystalline quartz wedge having a preselected wedge angle utilized as a polarizer, an electro optic switch having a pair of electrodes, and a second crystalline quartz wedge identical to the first and also utilized as a polarizer, the crystalline wedges having the optic axis oriented parallel to the apex thus providing double refraction to obtain an angular separation of the horizontal and vertical polarizations.

3,959,741

INTERHALOGEN BASED COMBUSTION-DRIVEN LASER WHICH PROVIDES CONTINUOUS WAVE OUTPUT LASING FROM DUAL SPECIES

Richard A. Meinzer, Rocky Hill, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed June 9, 1975, Ser. No. 585,274
Int. Cl.² H01S *3/22*
U.S. Cl. 331—94.5 G **7 Claims**



1. A method of producing continuous radiation in a laser system having two discrete species lasing simultaneously including the steps of:

providing a flow of gas which includes atoms of fluorine and a gas selected from the fluorine interhalogen group consisting of chlorine fluoride, bromine fluoride and iodine fluoride;

admixing molecular hydrogen to the flow to allow the atomic fluorine to react with the hydrogen and from vibrationally excited hydrogen fluoride and atomic hydrogen;

reacting the fluorine interhalogen with the atomic hydrogen to form a vibrationally excited hydrogen halide and atomic fluorine; and

passing the excited hydrogen fluoride and hydrogen halide through an optical cavity to produce an output beam of electromagnetic radiation having wavelengths characteristic of these excited species.

3,959,742

OSCILLATING APPARATUS

James E. Hermansdorfer, Charlottesville, Va., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 14, 1975, Ser. No. 567,794
Int. Cl.² H03K *3/353*
U.S. Cl. 331—111 **4 Claims**

1. An oscillating apparatus comprising:

timing means for providing timing signals;

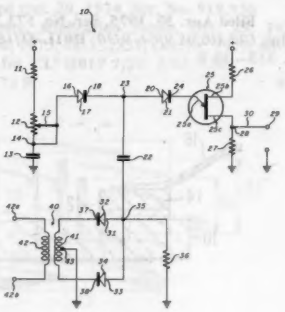
a first unidirectional current conductive means having an input terminal and an output terminal, coupled to said timing means at said input terminal, and so poled that currents are conducted from said input terminal to said output terminal;

a second unidirectional current conductive means, having an input terminal and an output terminal, said input terminal coupled to said output terminal of said first unidirectional current conductive means thereby forming a first node;

a first capacitor, having a first terminal and a second terminal, said first terminal coupled to said first node, said first capacitor with said timing means determining a timing signal at said first node;

means coupled to said second terminal of said first capacitor for supplying synchronizing signals so that the sum of

said timing signals and said synchronizing signals exists at said first node; and



oscillating means, coupled to said output terminal of said second unidirectional current conductive means, for causing oscillations having a frequency dependent on said sum of said timing and synchronizing signals at said first node.

3,959,743
LINEAR VOLTAGE-CONTROLLED SAW-TOOTH OSCILLATOR

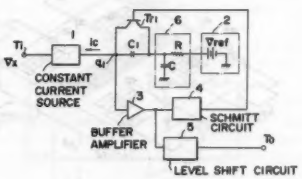
Yasuo Nagahama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed May 27, 1975, Ser. No. 581,185

Claims priority, application Japan, May 29, 1974, 49-62351[U]

Int. Cl.² H03K *4/50*

U.S. Cl. 331—111 **1 Claim**



1. In a voltage-controlled oscillator for oscillating a saw-tooth wave signal of a frequency corresponding to an input control voltage comprising a voltage source for charging a capacitor, a constant current control circuit for controlling a charging current to become a value corresponding to the input control voltage, and discharging means for causing the capacitor to discharge by short-circuiting upon detection of voltage across the charged capacitor when the voltage has reached a predetermined value, the voltage variation caused by the charging and discharging of the capacitor being output from the oscillator as the saw-tooth wave signal, an improvement comprising additionally a low-pass filter circuit connected between the voltage source and the capacitor for making relationship between the input control voltage and the output oscillation frequency substantially linear.

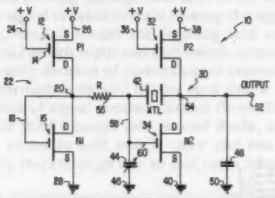
3,959,744
CMOS OSCILLATOR HAVING BIAS CIRCUIT OUTSIDE OSCILLATOR FEEDBACK LOOP

Arthur H. O'Connor, Lancaster, Pa., assignor to Time Computer, Inc., Lancaster, Pa.

Filed Feb. 26, 1975, Ser. No. 553,101

Int. Cl.² H03B *5/36*

U.S. Cl. 331—116 R **11 Claims**



1. A low power oscillator comprising a complementary pair of MOS transistors, means coupled to at least one of said transistors forming an oscillatory feedback path for said one transistor, a source of bias potential for said one transistor, and a bias resistor external of said feedback path coupling said source to said transistor, said source of bias potential comprising a second complementary pair of MOS transistors.

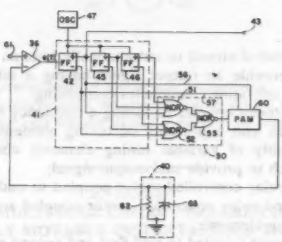
3,959,745
PULSE AMPLITUDE MODULATOR

Lawrence LaGuardia, Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 24, 1975, Ser. No. 589,740

Int. Cl.² H03K *13/22*

U.S. Cl. 332—11 D **3 Claims**



1. A pulse amplitude modulator, comprising:

a source of first digital signals representative of the polarity of the error between a first analog signal and a second, synthesized, analog signal;

a source of second digital signals representative of the presence or absence of a predetermined number of like consecutive bits within said first digital signals;

an output terminal;

a capacitor circuit responsive to said second digital signals and including:

means for generating and storing a first voltage, V_H, said voltage increasing at a predetermined rate when a presence of like consecutive bits is detected and decreasing when an absence of like consecutive bits is detected, and

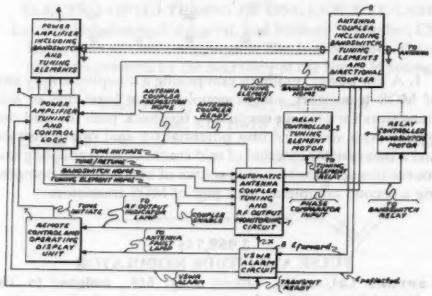
means for generating and storing a second voltage, V_L, said voltage decreasing at a predetermined rate when a presence of like consecutive bits is detected and increasing when an absence of like consecutive bits is detected, and

means responsive to said first digital signals for selectively routing V_H or V_L to the output terminal, the choice of said selection being determined by the polarity of the error.

3,959,746
AUTOMATIC ANTENNA COUPLER TUNING CONTROL CIRCUIT

Richard D. Straw, San Francisco, Calif., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Continuation-in-part of Ser. No. 407,325, Oct. 17, 1973, abandoned. This application Nov. 18, 1974, Ser. No. 524,436
Int. Cl.² H03H 7/40, 7/10; H03J 5/00
U.S. Cl. 333—17 M 12 Claims


POWER AMPLIFIER INCLUDING BANDSWITCH AND TUNING ELEMENTS
ANTENNA COUPLER INCLUDING BANDSWITCH, TUNING ELEMENTS AND DIRECTIONAL COUPLER
POWER AMPLIFIER TUNING AND CONTROL LOGIC
RELAY CONTROLLED TUNING ELEMENT MOTOR
RELAY CONTROLLED BANDSWITCH MOTOR
AUTOMATIC ANTENNA COUPLER TUNING AND R.F. OUTPUT MONITORING CIRCUIT
REMOTE CONTROL AND OPERATING DISPLAY UNIT
VSWR ALARM CIRCUIT
Forward
Reflected

1. A control circuit to automatically tune an antenna coupler to provide an output signal having a selected one of different operating frequencies comprising:

said antenna coupler including a frequency band selecting switch and a plurality of tuning elements including a plurality of variable tuning elements coupled to said switch to provide said output signal;

a first relay controlled motor coupled to said switch;

a second relay controlled motor coupled to said variable tuning elements;

first means coupled to said first and second motors to control the tuning of said antenna coupler sequentially through a preposition step, a tuning step and an antenna coupler ready step;

an amplitude comparator having a given capture range coupled to said antenna coupler; and

second means coupled to said amplitude comparator, said first means and said second motor;

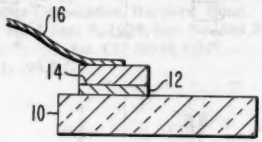
said second means being responsive to a first output signal of said amplitude comparator produced when said output signal of said antenna coupler is in said given capture range to control said second motor to tune said variable tuning elements during said tuning step; and

said second means being responsive to a second output signal of said amplitude comparator produced when said output signal of said antenna coupler is outside said given capture range to control said second motor to tune said variable tuning elements during said tuning step until said output signal of said antenna coupler is within said given capture range and said first output signal of said amplitude comparator can then control said second motor through said second means to tune said variable tuning elements during said tuning step.

3,959,747
METALLIZED LITHIUM NIOBATE AND METHOD OF MAKING

Zygmond Turski, Trevose, Pa., and John Louis Vossen, Jr., Somerville, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,390
Int. Cl.² H03H 9/04, 9/30; H01L 41/18, 41/22
U.S. Cl. 333—30 R 10 Claims

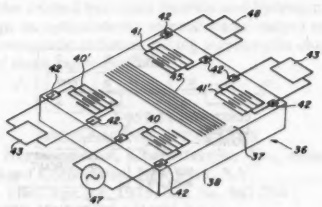


1. An acoustic delay line comprising a single crystal of lithium niobate, a first layer of magnesium metal on at least a portion of the surface of said crystal and a second layer of another conductive metal on said magnesium layer.

3,959,748
DUAL SIDESTEPPING SWIF AND METHOD

Sundaram Subramanian, Evanston, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Dec. 26, 1973, Ser. No. 428,584
Int. Cl.² H03H 9/26, 9/30, 9/32; H01L 41/22
U.S. Cl. 333—72 14 Claims



1. A method of manufacturing sidestepping acoustic surface wave filters in which surface waves created in a piezoelectric medium by a transmitting transducer are guided to an offset receiving transducer by an interposed multistrip coupler and in which said offset results in vacant areas upon said piezoelectric medium, comprising the steps of:

forming a first and a second pair of transducers and a multistrip coupler upon a surface of said piezoelectric medium, such that said second transducer pair occupies areas of said piezoelectric medium left vacant by the sidestepping configuration of said first transducer pair; and

choosing for future use the most favorable of said transducer pairs and disabling at least one transducer of said other pair.

3,959,749

FILTER OF THE DISTRIBUTED CONSTANTS TYPE

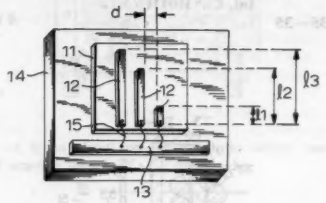
Horishi Ikushima, Katano, and Hideo Yamaoki, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 29, 1974, Ser. No. 518,936

Claims priority, application Japan, Oct. 29, 1973, 48-121924; Oct. 30, 1973, 48-122337; Oct. 31, 1973, 48-123162

Int. Cl.² H01P 1/20, 3/08, 5/08

U.S. Cl. 333—73 R 8 Claims



1. A filter of the distributed constants type comprising a first dielectric substrate of ceramic material having a specific dielectric constant in the range of 30 to 800, a transmission line electrode, at least one branch electrode being electrically connected to said transmission line electrode and being on one surface of said dielectric substrate, a ground electrode on the opposite surface of said dielectric substrate, and a second dielectric substrate having a specific dielectric constant less than 30, said tranmission line electrode being on said second substrate.

3,959,750

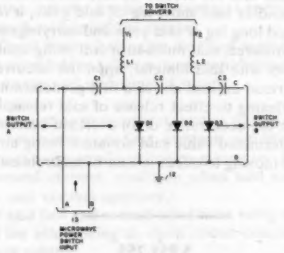
MICROWAVE DIODE SWITCH WHEREIN FIRST DIODE CARRIES GREATER CONTROL SIGNAL CURRENT THAN SECOND DIODE

Frank Holt, Hollis, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed May 22, 1975, Ser. No. 580,098

Int. Cl.² H01P 1/15

U.S. Cl. 333—97 S 5 Claims



1. A switch having an input and an output with first and second transmission line conductors connected there between, a first and a second diode individually connected across said conductors, said first diode being connected across said conductors closer to said switch input than said second diode, means for generating a first control signal,

means for generating a second control signal,

first means for applying both said control signals to said first diode, second means for applying both said control signals to said second diode, said first control signal causing both said diodes to conduct to a place a short circuit connection across said conductors which prevents a radio frequency signal present at said switch input from being coupled via said conductors to said switch output, said second control signal causing both said diodes to be in their non-conducting state to place an open-circuit connection across said conductors which allows said radio frequency signal at said switch input to be coupled via said conductors to said switch output, first means for isolating said control signals applied to said first diode from said second diode so that changes in control signal created current flowing through said first diode will not affect control signal created current flowing through said second diode, second means for isolating said control signals from said switch input and said switch output, and means for causing division of control signal created current flowing through both said diodes such that a larger quantity of control signal created current flows through said first diode than through said second diode, as said first diode is closer to said switch input and has more current flowing therethrough due to said radio frequency signal.

3,959,751

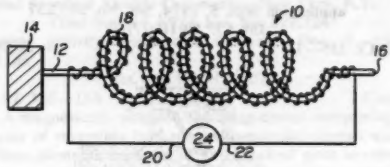
ELECTROMECHANICAL TRANSDUCER HAVING CIRCULARLY MAGNETIZED HELICALLY WOUND MAGNETOSTRICTIVE ROD

Ivan J. Garshelis, 61 Oleander Way, Clark, N.J. 07066

Filed July 12, 1974, Ser. No. 488,219

Int. Cl.² H01H 55/00

U.S. Cl. 335—3 20 Claims



1. An electromechanical transducer comprising:

a circularly magnetized, magnetostrictive, coiled rod; and

a conductive coil wound about a portion at least of said coiled rod.

3,959,752

NARROW MULTI-POLE CIRCUIT BREAKER HAVING BODILY MOVABLE INSTANTANEOUS TRIP STRUCTURE

Albert Strobel, Cherry Hill, N.J., and Charles T. Robins, Swarthmore, Pa., assignors to I-T-E Imperial Corporation, Spring House, Pa.

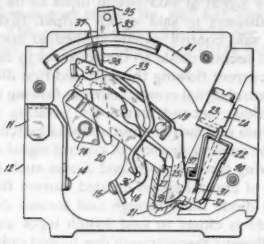
Filed Mar. 4, 1975, Ser. No. 555,164

Int. Cl.² H01H 75/100, 77/100

U.S. Cl. 335—10 5 Claims

1. A circuit breaker having a plurality of poles and including, for each pole thereof, cooperating contact means, releasable operating means for opening and closing said contact means, latch means for maintaining said operating means in operative condition to close said contact means, and fault current responsive trip means which when actuated trips said latch means to release said operating means which renders the latter inoperative to close or maintain said contact means closed; said trip means including an electromagnet comprising a relatively stationary magnetic frame and a magnetic armature movable from a normal forward position rearward through a latch releasing position upon predetermined energization of said electromagnet, tie means interconnecting said armatures of said plurality of poles for simultaneous operation thereof; biasing means for said armature urging the latter toward said normal position; within a pole carrying fault cur-

rent said armature being moved rearward magnetically to said latch releasing position after which said armature is moved further to the rear through operative engagement thereof by



said operating means with this further movement to the rear assuring that armatures in all remaining poles will be moved rearward by said tie means at least to their latch releasing positions.

3,959,753

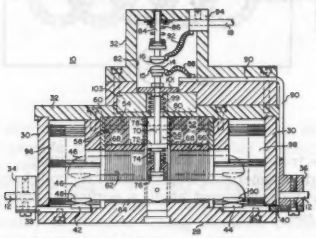
CIRCUIT INTERRUPTER WITH LOAD SIDE SHORT CIRCUIT

John A. Wafer, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 436,588, Jan. 25, 1974. This application Sept. 5, 1974, Ser. No. 503,231

Int. Cl.² H01H 77/10

U.S. Cl. 335—16 **10 Claims**



1. A circuit interrupter protective device for responding to higher abnormal currents on the supply side than on the load side of an electrical distribution system, comprising a housing, a circuit interrupter structure in said housing and comprising first stationary contact means, first movable contact means cooperable with said stationary contact means, a contact carrier carrying said movable contact means, support means supporting said contact carrier for movement between closed and open positions, a magnetic drive structure comprising a magnetic device of magnetic material having an open slot therein open at one end thereof and closed at the other end thereof, said contact carrier being positioned in said slot in proximity to the open end of said slot, said support means including movable means for moving said contact carrier to the closed position, the circuit through said circuit interrupter passing through said contact carrier and said contacts in the closed position of said contact carrier, a second pair of contacts cooperating with the contact carrier and in a shorting circuit parallel with the load side of the system, and the second pair of contacts being movable between open and closed positions substantially simultaneously with the first and second pairs of contacts, and upon the occurrence of an overload current above a predetermined value through the contact carrier the magnetic flux generated by the current in the contact carrier operating in the magnetic device to drive the contact carrier into the slot toward the closed end of the slot to thereby open the first contacts and causing the second contacts to close.

3,959,754

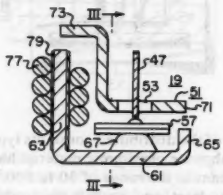
CIRCUIT BREAKER WITH IMPROVED TRIP MEANS

Stephen A. Mrenna, Beaver, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 25, 1974, Ser. No. 509,169

Int. Cl.² H01H 75/12

U.S. Cl. 335—35 **4 Claims**



1. A circuit breaker comprising a pair of cooperable contacts, a latched releasable member releasable to effect automatic opening of said contacts, trip means comprising an elongated bimetal supported in proximity to one end thereof, a magnetic yoke fixedly supported on said bimetal, said yoke being generally U-shaped and comprising a long leg and a short leg, a magnetic armature supported on said bimetal for movement relative to said yoke, said armature comprising an intermediate part and two armature legs extending from the opposite ends of said intermediate part generally transverse to said intermediate part in opposite directions from each other, a first of said armature legs being opposite the end of said long leg of said yoke and the second of said armature legs being opposite the end of said short leg of said yoke, a multi-turn coil around said long leg of said yoke and carrying the current through said breaker, said multi-turn coil being connected in electrical series with said bimetal, upon the occurrence of a sustained overload current above a first predetermined value said bimetal flexing to effect release of said releasable member, and upon the occurrence of an overload current above a second predetermined value said armature being attracted to said yoke and moving to effect release of said releasable member.

3,959,755

CIRCUIT BREAKER WITH IMPROVED DELAY

George S. Harper, and Lyal N. Merriken, both of Cambridge, Md., assignors to Airpax Electronics Incorporated, Cambridge, Md.

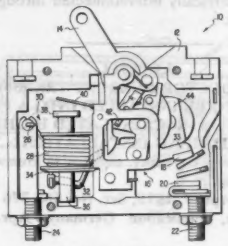
Filed Dec. 13, 1974, Ser. No. 532,645

Int. Cl.² H01F 7/18

U.S. Cl. 335—63 **10 Claims**

1. A circuit breaker comprising a pair of electrical contacts, a handle, a collapsible toggle coupling said handle to one of said contacts, a movable armature having a portion adapted to engage and trip said toggle, a frame, a hollow delay tube carried by said frame and having a magnetic pole piece at one end, a magnetic core movable in said delay tube, spring means in said tube normally biasing said core away from said pole piece, and a trip coil surrounding a portion of said trip tube,

said coil being spaced from the plane of the near end of said pole piece by a nonconductive, nonmagnetic gap having a



length of from about one-fifteenth to about one-sixth the overall interior length of said delay tube.

3,959,756

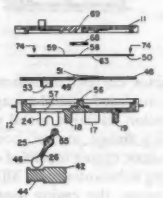
ELECTRICAL SWITCHING DEVICE

Andrew F. Deming, Alliance, Ohio, assignor to The Alliance Manufacturing Company, Inc., Alliance, Ohio

Filed Oct. 23, 1974, Ser. No. 517,046

Int. Cl.² H01H *51/08*

U.S. Cl. 335—139 **21 Claims**



1. An electrical switching device, comprising in combination:

support means;

switching means having a contact aperture extending through said switching means;

one of said means having an indexing aperture;

means establishing relative movement between said switching means and said support means;

a contact;

means mounting said contact relative to said support means for establishing a first contact condition when said contact engages said switching means and for establishing a second contact condition when said contact extends into said contact aperture,

one of said first and second conditions being a closed circuit and the other being an open circuit condition;

indexing means;

and means mounting said indexing means for engaging said indexing aperture to relatively move said contact aperture and said contact to switch said contact between said first and second contact conditions.

3,959,757

CIRCUIT BREAKER WITH MAGNETIC ASSIST

David L. Elsnor, Norton, Mass., and Roland G. Morin, Central Falls, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 21, 1974, Ser. No. 481,593

Int. Cl.² H01H *53/00*

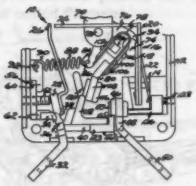
U.S. Cl. 335—147 **10 Claims**

1. A circuit breaker comprising:

a casing;

stationary contact means mounted in the casing;

movable contact means movably mounted in the casing and movable into and out of engagement with the stationary contact means;



overcurrent means mounted in the casing adapted to cause the movable contact means to move out of engagement with the stationary contact means upon the occurrence of a predetermined overcurrent;

a contact engagement assist means to increase the contact force between the movable and stationary contact means upon engagement of the movable with the stationary contact means; and

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3,959,758

MAGNETICALLY ACTUATED SWITCHING DEVICE

Wolfgang Grobe, Ludwigsburg, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 27, 1974, Ser. No. 527,724

Claims priority, application Germany, Dec. 7, 1973, 2361185

Int. Cl.² H01H *51/27*

U.S. Cl. 335—153 **2 Claims**

1. A magnetically actuated switching device comprising:

a pair of reversible hard magnetic material contact armature elements enclosed in an elongated glass envelope, the terminal leads of said elements protruding externally from the elongated ends of said envelope and sealed therein;

a pair of electromagnet coils, each coil of the pair surrounding said envelope and positioned adjacent one of said elements to produce a maximum magnetic flux through said adjacent contact armature elements;

said elements being selectively annealed to restrict the coercive force within said contact armature elements to be a maximum within the section adjacent the associated electromagnetic coil; and

said element having a lesser coercive force exterior the area of the coils.

3,959,759

CONTACT DRIVE FOR ELECTRO-MAGNETIC RELAYS

Hans-Werner Reuting, Peine, Germany, assignor to Elmeg Elektro-Mechanik GmbH, Peine, Germany

Continuation-in-part of Ser. No. 485,322, July 3, 1974. This application Feb. 3, 1975, Ser. No. 546,800

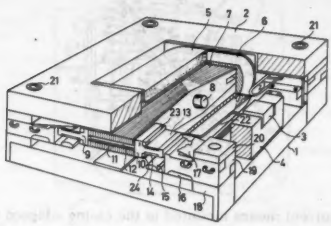
Claims priority, application Germany, Feb. 2, 1974, 2405104

Int. Cl.² H01H *50/64*

U.S. Cl. 335—203 **4 Claims**

1. In an electromagnetic relay having a displaceable armature to be displaced upon energization of a coil means, whereby the armature pivots on an axis, the relay having a contact and at least one stationary counter contact, the improvement comprising, a rigid contact carrier on which said contact is mounted to an extreme end on the armature, remotely from the axis but extending parallel to the axis and not beyond said armature end so that the stroke of the armature end has the same length as the stroke of the contact moving with the said end of the armature and in a direction transverse

to said axis, the carrier being made of insulating material there being at least one contact on the carrier, being driven by the armature and following its movement without resilient, stroke-modifying displacement relative thereto, said stationary counter contact being laterally displaced from the armature



for selective engagement with and disengagement from the contact on the contact carrier upon displacement respectively of the armature in the one or the respective opposite direction; and a carrier for said stationary counter contact and having greater resiliency than said carrier on said armature.

3,959,760

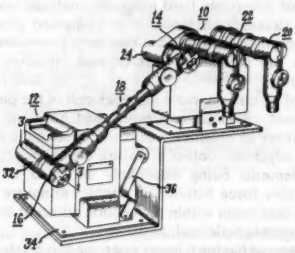
DRY TYPE INSTRUMENT TRANSFORMER WITH POTENTIAL TAP AND CONNECTOR THEREFOR

Ronald J. Ouellette, Derry, N.H.; Robert S. Canney, Berwick, Maine, and Ralph B. Stetson, Exeter, N.H., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,704

Int. Cl.² H01F *15/04, 27/04*

U.S. Cl. 336—84 **1 Claim**



1. A dry-type current transformer and potential transformer interconnected for metering application comprising; a potential tap in said current transformer, said potential tap comprising a well formed in the insulating body of said current transformer, a terminal member recessed in said well and connected to the high voltage winding of said current transformer, at least one potential tap in said potential transformer, said potential transformer potential tap comprising a well formed in the insulating body of said potential transformer, a terminal member recessed in said well and connected to the high voltage winding of said potential transformer, a pair of elbow modules, each elbow module comprising an elongated, insulated male member for insertion into said well in said current transformer or said potential transformer and having a conductor extending beyond said insulated male member, one of said pair of elbow modules inserted in said well of said current transformer and in electrical engagement with said current transformer recessed terminal, the other of said pair of elbow modules inserted in said well of said potential transformer and in electrical engagement with said potential transformer recessed terminal, a cable electrically interconnecting said pair of elbow modules, ground coatings formed respectively on each of said current transformer and said potential transformer and on each of said pair of elbow modules, said ground coatings being electrically interconnected through a ground wire on said cable.

3,959,761

SINGLE CONDUCTOR CURRENT TRANSFORMER ADAPTED TO BE INSTALLED INTO A FULLY INSULATED, METAL-ENCAPSULATED HIGH-VOLTAGE SWITCHING INSTALLATION

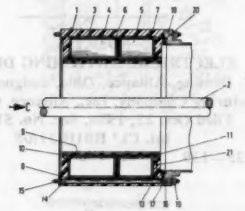
Otto Graul, Bamberg, Germany, assignor to Messwandler-Bau GmbH, Germany

Filed Apr. 7, 1975, Ser. No. 565,376

Claims priority, application Germany, Apr. 8, 1974, 2417023

Int. Cl.² H01F *40/06*

U.S. Cl. 336—84 **26 Claims**



1. A single-conductor current transformer adapted to be installed into a fully insulated, metal-encapsulated high-voltage switching installation having a metal encapsulation provided with connecting flange means, comprising core and secondary winding means, casing means of electrically insulating material protecting substantially on all sides the core and secondary winding means, the casing means being provided within the area of its inner circumferential surface with an at least semi-conducting lining means and being effective to provide a low-voltage insulation, with the high-voltage insulation of the current transformer to be constituted by insulating gas on the inside of the encapsulation of the high-voltage switching installation, characterized in that the insulating casing means forms itself a pressure housing for the insulating gas on the inside of the high-voltage switching installation, the insulating casing means being operable to be secured with its end faces at the connecting flange means, pipe means extending through the insulating casing means in the outer edge area thereof and fastening bolt means in said pipe means adapted to be connected with the connecting flange means of the metal encapsulation.

3,959,762

THERMALLY RESPONSIVE ELECTRICAL SWITCH

Ronald E. Senor, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

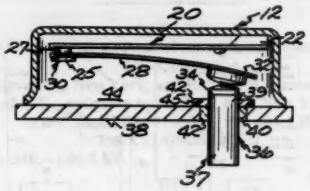
Filed Dec. 9, 1974, Ser. No. 530,630

Int. Cl.² H01H *61/02*

U.S. Cl. 337—102 **9 Claims**

1. A thermostatic switch comprising a metallic casing having an open and closed end, a header plate having an aperture therethrough, said header plate welded to said open end to define a switch chamber, a terminal pin extending through said aperture and mounted in electrically insulated relation to said header plate, a stationary contact mounted on said terminal pin within said switch chamber, a heater element having a fixed and a free end, said element having the fixed end attached to said closed end of said casing and extending in cantilever relation therefrom, a snap-acting dish-shaped bimetallic member having two ends, at one end cantilever mounted

to the free end of said heater element and at the other end carrying a movable electrical contact for movement between a first closed contact position and a second open contacts



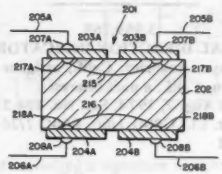
position with said stationary contact and an annular insulator positioned around said terminal pin adjacent to said stationary contact on one side and said header plate on the other.

3,959,763

FOUR TERMINAL VARISTOR

Henry C. Sibley, Adams Basin, N.Y., and Willis R. Smith, Johannesburg, South Africa, assignors to General Signal Corporation, Rochester, N.Y.

Filed May 17, 1975, Ser. No. 569,046
Int. Cl.² H01C 7/12
U.S. Cl. 338—21 **11 Claims**



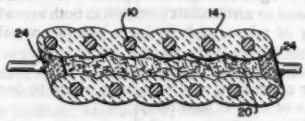
1. A varistor comprising in combination:
a. a body having a voltage dependent nonlinear impedance; and
b. first and second pairs of electrical contact means coupled to first and second metalized areas, respectively, bonded to said body for providing for electrical connections between said body and external components.

3,959,764

GAS ANALYZING ELEMENT

Charles E. Allman, San Jose, Calif., assignor to Dictaphone Corporation, Rye, N.Y.

Filed Oct. 9, 1974, Ser. No. 513,418
Int. Cl.² H01C 13/00
U.S. Cl. 338—34 **21 Claims**



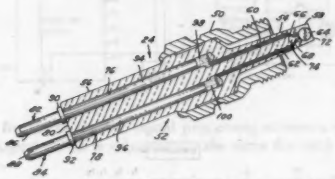
1. A resistive element for a catalytic combustion type gas analyzer comprising:
a coiled filament formed of an electrical conductor whose electrical resistance varies with temperature, the coiled filament being helical and defining a hollow space along its longitudinal axis;
a coating of refractory ceramic material on the filament, the coating being predominately alumina mixed with other refractory oxides including manganese dioxide and titanium dioxide to form a eutectic mixture having a maturation temperature range of 1200°C. to 1400°C., at which it forms a dense, gas tight sheath the coating further being integral between adjacent loops of the helical coil, and
a core of catalytic material packed into the hollow space formed by the coiled filament.

3,959,765

STOICHIOMETRIC AIR/FUEL RATIO EXHAUST GAS SENSOR

Karen L. Stewart, Woodhaven, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sept. 2, 1975, Ser. No. 609,768
Int. Cl.² H01C 13/00
U.S. Cl. 338—34 **10 Claims**



8. An improved partial pressure of oxygen sensor for insertion in the exhaust system of an internal combustion engine comprising in combination:
housing body means;
a ceramic insulator means received within said housing body means and having a forwardly extending, slotted, end portion, an oppositely positioned rear face and a first pair of generally parallel passages extending from said slotted end portion rearward;
said slotted end portion having a counter-bore extending generally parallel to said first pair of passages, the axis of the counter-bore coinciding with the slot;
a wafer of partial pressure of oxygen responsive ceramic material received within the slot of said slotted end portion to a depth which exceeds the height of said wafer whereby said wafer may be protected from direct impingement of pressure pulses;
said wafer having a pair of leads connected thereto in spaced apart relation and extending from said wafer through said first pair of passages;
electrical means communicating said wafer leads to utilization means; and
seal means to seal said wafer leads in said first pair of passages in gas tight fashion.

3,959,766

TARGET SIMULATOR SYSTEM

Donald M. Nees, Tacoma; Alan L. Lindstrum, Port Blakely, and Michael L. Barlow, Silverdale, all of Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

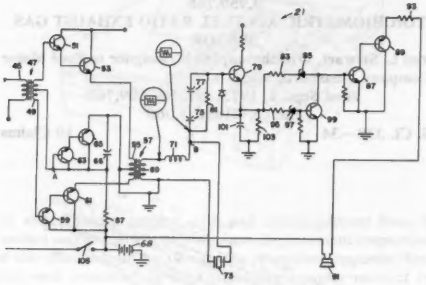
Filed Sept. 26, 1974, Ser. No. 509,526
Int. Cl.² G09B 9/00; G01S 9/66
U.S. Cl. 340—3 E **4 Claims**

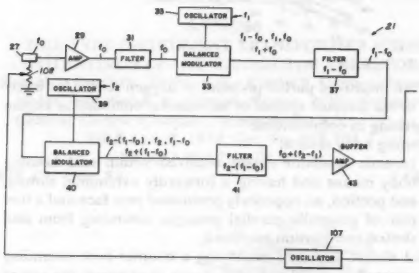
1. A target simulator system comprising:
a. an acoustic receiving transducer for receiving a signal;
b. first means operatively connected to the output of said acoustic receiving transducer for doppler shifting the output signal of said acoustic receiving transducer;
c. said first means including a first balanced modulator, a first filter, a second balanced modulator and a second filter connected in series; a first oscillator connected to said first balanced modulator, a second oscillator con-

nected to said second balanced modulator and an amplifier circuit;

d. the output of said second filter being connected to the input of said amplifier circuit and the output of said amplifier circuit being connected in parallel to a first acoustic transmitting transducer and to a monitor circuit;

e. said monitor circuit including a first voltage level detector means for detecting a first voltage level and a second





voltage level detector means for detecting a second voltage level; the output of said first and second voltage level detector means applied to a gating circuit, said gating circuit being connected to a second acoustic transmitting transducer; whereby

f. said second acoustic transmitting transducer provides an output signal only when the output of said amplifier circuit is between said first and second voltage levels.

3,959,767

DATA TRANSMISSION SYSTEM

Miles A. Smither, and Lawrence E. Trowbridge, both of Harris, Tex., assignors to General Electric Company, Fairfield, Conn.

Filed Aug. 21, 1974, Ser. No. 499,361
Int. Cl.² G01V *1/40*
U.S. Cl. 340—18 P **12 Claims**

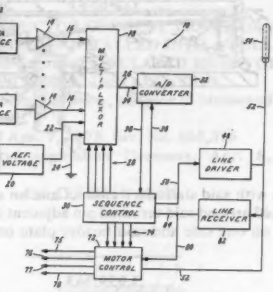
1. Apparatus for communicating information from a plurality of data sources located in a borehole to a remote location, comprising: multiplexer means, said multiplexer means being provided with a plurality of inputs and an output, said inputs being adapted to receive input signals from said plurality of data sources, said multiplexer means being adapted to connect selected ones of said plurality of inputs to said output:

means for individually subtracting the direct current offset level from the signal of each data source;

analog to digital converter means for converting the output of said multiplexer means to a digital signal;

sequence control circuit means, said control circuit means providing signals to said multiplexer means for controlling the sequence of connecting said inputs to said output of said multiplexer means and providing an address signal to the data corresponding to the selected input of said multiplexer means;

means for applying the output signal of said analog to digital converter means aad said address signal to a power cable mounted in the borehole; and



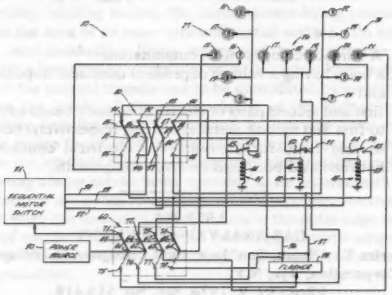
control unit means located at the remote location, said control unit means including means responsive to the address signal and the data from the data source selected by said multiplexer means to provide an indication of the information from at least one of said plurality of data sources.

3,959,768

DUAL DIRECTION INDICATOR

E. Raymond Mayo, Anaheim, Calif., assignor to Walter K. Hurtt, Anaheim, Calif., a part interest

Filed Aug. 2, 1974, Ser. No. 494,218
Int. Cl.² G08G *1/00*; B60Q *1/26*
U.S. Cl. 340—82 **7 Claims**



1. A dual direction indicator comprising:

a plurality of lights arranged in opposed arrowhead configurations and an arrow shaft common to both arrowheads;

a plurality of relays, each having a pair of normally open contacts;

a source of energizing signal;

means for conducting said energizing signal to one of said contacts of each of said relays;

first swich means for sequentially energizing a plurality of output lines;

second switch means for interconnecting said output lines wih said relays to activate same to close said normally open contacts, said second switch means permitting activation of said relays in one of two opposing sequences; and

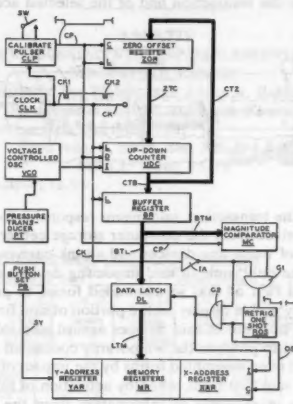
means including said second switch means and said energizing signal conducting means for connecting the other of said contacts of each of said relays to said lights so as to

sequentially energize said arrow shaft and then one of said arrowheads, depending on the position of said second switch means, to indicate one of two opposed directions.

3,959,769
METHOD AND APPARATUS FOR RECORDING A SIGNATURE

Jacob Sternberg, New York, and Robert W. Freund, Brooklyn, both of N.Y., assignors to Veripen, Inc., New York, N.Y.

Filed June 20, 1974, Ser. No. 481,138
Int. Cl.² G06K 9/00
U.S. Cl. 340—146.3 SY **11 Claims**



1. Method of recording a signature comprising the steps of generating an analog electrical signal having a variable property which represents the variable pressure between a stylus and writing surface exerted by a subject when signing a signature, performing a plurality of periodically occurring samplings of the analog electrical signal during the signing of the signature wherein each sampling requires a given period of time, generating for each sampling a coded combination of bits defining a number related to the amplitude of the variable property of the analog electrical signal during the given period of time whereby a plurality of coded combinations of bits defining numbers representing the variable property are generated during the signing of the signature, forming a reference coded combination of bits defining an offset number representing the amplitude of the variable property of the analog electrical signal when the subject is not signing a signature, and subtracting the offset number from each of said numbers representing the variable property of the analog electrical signal.

3,959,770
METHOD AND APPARATUS FOR ERROR COMPENSATION IN MULTICHANNEL SYSTEMS

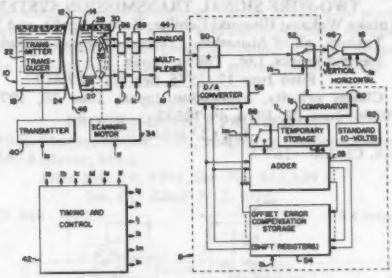
Louis F. Schaefer, Palo Alto, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed Oct. 21, 1974, Ser. No. 516,674
Int. Cl.² H04B 1/62
U.S. Cl. 340—146.1 E **15 Claims**

1. In an arrangement of the type which includes a plurality of substantially identical signal processing channels having input circuits to which input signals are applied and which signal processing channels are designed to provide identical output signals with identical input signals, error compensating means for compensating for variations in operating characteristics of said signal processing channels to substantially equalize selected operating characteristics of the channels, said error compensating means comprising:

error compensation signal storage means for storage of error compensation signals for each channel;

means for combining the outputs from said signal processing channels with associated error compensation signals in storage to compensate for variations in certain signal processing channel operating characteristics,



means for supplying the signal processing channels with a test signal which is substantially the same for each channel;

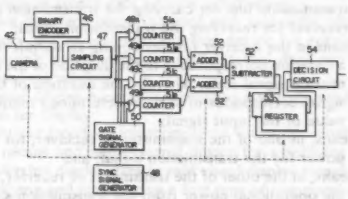
signal standard means related to said test signal, and

means for sensing variations of test signal outputs from sad combining means from said related signal standard means and updating said stored error compensation signals accordingly.

3,959,771
PATTERN RECOGNITION APPARATUS

Takeshi Uno, Sayama; Sadahiro Ikeda, Hachioji; Masakazu Ejiri, Tokorozawa, and Jun Motoike, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 11, 1973, Ser. No. 405,257
Claims priority, application Japan, Dec. 8, 1972, 47-122508; Oct. 13, 1972, 47-101882
Int. Cl.² G06K 9/04
U.S. Cl. 340—146.3 H **4 Claims**



1. In a pattern recognition apparatus for determining at least one of the shape and position of an object to be recognized comprising means for scanning objects to obtain video signals representing the shape of the objects, means for quantizing and sampling said video signals to provide output signals in accordance therewith, and means for processing the output signals to detect at least one of whether an object has a specified shape, and the position of the object, the improvement wherein said processing means comprises:

means connected to said quantizing and sampling means for generating four specified regions arranged in one direction,

means connected to said generating means for measuring an area, where the output signal has a preassigned value, within each of said four specified regions,

means for performing one arithmetic operation ($a-b+c-d$) between said measured areas of said four specified regions, where a, b, c, and d are said measured areas of said four individual specified regions, and

means for determining the position of the object from the sign change of the result of the one arithmetic operation.

3,959,772

TWO-WIRE SIGNAL TRANSMISSION SYSTEM

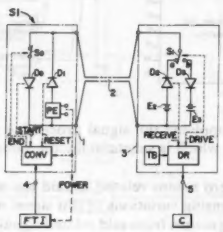
Yutaka Wakasa; Hisayuki Uchiike; Koju Kataoka, and Yasuro Takiura, all of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed June 17, 1975, Ser. No. 587,619

Claims priority, application Japan, June 20, 1974, 49-70536; June 20, 1974, 49-70537

Int. Cl.² H04Q 9/14

U.S. Cl. 340—167 A **16 Claims**



1. A signal transmission system of the type used in process control systems for conveying a signal between a field instrument and a central controller, or between a central controller and a process control device, comprising:

a transmitter arranged to accept an input signal;

converter means in the transmitter for developing a pulse width signal with a duration corresponding in a predetermined manner to the value of the input signal;

means in the transmitter for providing a transmission signal with two states, said means being responsive to the converter means to cause the duration of one of the transmission signal states to correspond to the duration of the pulse width signal;

a transmission line for carrying the transmission signal;

a receiver for receiving the transmission signal;

means in the receiver for developing an output signal with a duration corresponding to the duration of the one transmission signal state, whereby the duration of the output signal corresponds in said predetermined manner to the value of the input signal;

means, in one of the transmitter or receiver, for supplying power for the transmission signal; and

means, in the other of the transmitter or receiver, for deriving operational power from the transmission signal;

whereby the signal transmission system is able to convey signals less affected by noise, and is also able to convey operational power.

3,959,773

DISPLAY MEANS AND APPARATUS FOR RECORDING FINANCIAL TRANSACTIONS

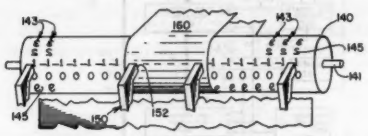
Ethon Hyman, 634 Elmgate, Glenview, Ill. 60025

Filed July 13, 1970, Ser. No. 54,414

Int. Cl.³ G06F 3/04, 3/10

U.S. Cl. 340—172.5 **8 Claims**

1. Apparatus for recording financial transactions comprising means for transmitting information to a computer storage center having data regarding a plurality of accounts and adapted to receive information from a point of transaction device relative to a selected account and to transmit information to the point of transaction device relative to the balance of the selected account before the transaction, the amount of the transaction and the balance of the selected account after the transaction, means including a first form and a second form assembled so that said first form overlies and temporarily conceals a face of said second form, and means responsive to the information received from the computer storage center relative to the selected account for producing on the first of said so assembled forms an immediately visible display of the amount of the transaction and on the said temporarily concealed face of said second form a temporarily concealed display of the amount of the transaction and for producing only on said temporarily concealed face of said second form a temporarily concealed display of the selected account balance before the transaction and of the selected account balance after the transaction, said means responsive to the information received from the computer storage center including a plurality of impacting devices and an ink-carrying member intermediate only some of said impacting devices and a portion of said first of said so assembled forms to produce an immediately visible display on the portion of said first form by the impact of some of said devices against said ink-carrying member and to produce the temporarily concealed display on said second of so assembled forms by the impact of all of said devices on said first form, whereby activation of said impacting devices in response to information from the computer storage center produces visible information on said portion of said first form in registry with said ink-carrying member and produces visible information on said second form over an area greater than said portion of said first form.



3,959,774

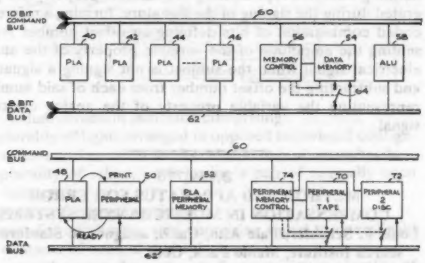
PROCESSOR WHICH SEQUENCES EXTERNALLY OF A CENTRAL PROCESSOR

Carver Mead, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed July 25, 1974, Ser. No. 491,647

Int. Cl.² G06F 9/16

U.S. Cl. 340—172.5 **14 Claims**



1. In a data processing system, having main memory means and data processing means, a separate system for ordering said processing system to perform data processing comprising

planned logic array (PLA) means for storing instructions required for ordering data processing by said main memory means and said data processing means,

a master planned logic array (PLA) means for storing codes specifying sequences of instructions in said planned logic

array means for performing desired data processing operations,

means for successively reading out said codes stored in said master planned logic array means and applying them to said planned logic array means,

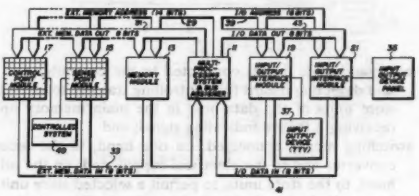
means, in said planned logic array means responsive to a code from said master planned logic array means, to read a sequence of instruction signals stored therein to said data processing means to instruct it how to process data, and

means in said planned logic array means responsive to the end of said sequence of instruction signals to signal said master planned logic array means to provide a code for ordering the next sequence of instructions.

3,959,775
MULTIPROCESSING SYSTEM IMPLEMENTED WITH MICROPROCESSORS

John G. Valassis, Des Plaines, and James R. Holden, Chicago, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Aug. 5, 1974, Ser. No. 494,446
Int. Cl.² G06F 15/16
U.S. Cl. 340—172.5 **4 Claims**



1. An expandable modular control system for controlling a second controlled system being monitored by said expandable modular control system comprising:

means comprising a sense point module and a control point module, each of said modules comprising an array of memory devices corresponding to a plurality of *n*-bit words, each *n*-bit word having a corresponding memory address associated therewith,

said sense point module being coupled to and monitoring said second system, said second system generating *n*-bit data words which are stored in said sense point module memory devices at assigned ones of said memory addresses responsive thereto,

said control point module being coupled to and controlling said second system in accordance with n-bit control words stored in said control point module memory devices at assigned ones of said memory addresses;

external modular memory means for storing said *n*-bit words at assigned memory addresses therein;

multiprocessing means including a plurality of microprocessor modules for asynchronously processing said *n*-bit data words to generate said n-bit control words for controlling said second system;

system bus means including extended memory address bus means and extended data transfer bus means intercoupling said multiprocessing means with said external modular memory means and said sense point and control point modules,

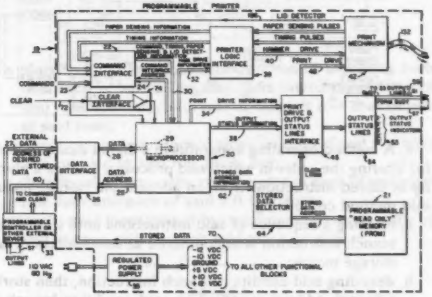
said modular microprocessors selectively addressing said memory addresses in said modular external memory means and said sense point and control point modules via said extended memory address bus means to transfer said *n*-bit words therebetween via said extended data transfer bus means for processing by said multiprocessing means to control said second system; and

bus assigner means including logic means assigning a priority of operation to each of said microprocessor modules for selectively assigning access to said system bus means to said microprocessor modules, each of said microprocessor modules having a different assigned priority, said bus assigner means assigning use of said system bus means to said microprocessor module having the highest priority whenever one or more of said microprocessor modules requests access to said external memory, said bus assigner means permitting transfer of said *n*-bit words between the selected one of said microprocessor modules having priority and the external modular memory means, the sense point module and the control point module.

3,959,776
PROGRAMMABLE PRINTER

Richard E. Morley, Mason, N.H., assignor to Modicon Corporation, Andover, Mass.

Filed Feb. 19, 1974, Ser. No. 443,329
Int. Cl.² G06F 7/12, 9/16
U.S. Cl. 340—172.5 **75 Claims**



1. An apparatus for visually displaying at least a portion of stored data in combination with at least a portion of external data from an external device, comprising:

A. a multi address memory means for storing said stored data;

B. a stored data selector interconnected with said multi address memory means for selecting said stored data in response to stored data address information;

C. a data interface interconnected with said multi address memory means and said external device for receiving, processing and transferring said external data and said selected stored data;

D. a visual display means for producing a visually readable character display;

E. an output interface interconnected with said visual display means and said external device for amplifying and transferring display data to said visual display means and amplifying and transferring a first type of command data representing the request for external data to said external device; and

F. a central processor interconnected with said stored data selector and said data and output interfaces incorporating first means for generating stored data address information; second means for receiving and processing said transferred selected stored data from the data interface into display data and command data so that said processed display data is received by the output interface for display and said first type of processed command data is received by the output interface for transferral to said external device for requesting the retrieval of external data; and third means for processing and transferring at least a portion of said retrieved external data into display data; whereby at least a portion of the selected stored data is displayed and at least a portion of the remaining portion of the selected stored data requests the retrieval of external data, of which at least a portion of the re-

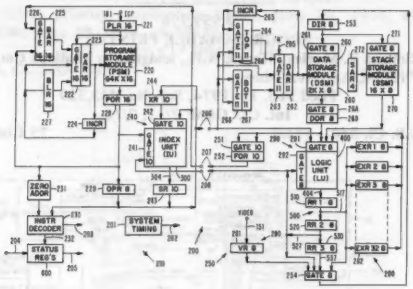
trieved external data is displayed with the displayed stored data.

3,959,777

DATA PROCESSOR FOR PATTERN RECOGNITION AND THE LIKE

Milton Jay Kimmel, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 17, 1972, Ser. No. 272,698
Int. Cl.[2] G06F *9/20, 9/10, 9/14*
U.S. Cl. 340—172.5 **14 Claims**



1. A method operating apparatus in a digital data processor for altering the order in which said processor fetches a plurality of stored instructions from an addressable storage means, said method comprising:

a. fetching a sequence of said instructions until a condition branch instruction is encountered at one address of said storage means;

b. decoding said condition branch instruction, then storing a branch address specified by said condition branch instruction;

c. incrementing said one address so as to produce a further address;

d. fetching a subsequent one of said instructions in said sequence from said further address of said storage means;

e. executing a particular operation, said particular operation being specified by said subsequent instruction from among a plurality of different possible operations;

f. detecting the occurrence of a particular condition resulting from said operation, said particular condition being specified by said subsequent instruction from among a plurality of different possible conditions;

g. if said condition does not occur, returning to step (c), and

h. if said condition occurs, substituting said branch address for said further address and fetching a further instruction from said branch address in said storage means.

3,959,778

APPARATUS FOR TRANSFERRING DATA FROM A VOLATILE MAIN MEMORY TO A STORE UNIT UPON THE OCCURRENCE OF AN ELECTRICAL SUPPLY FAILURE IN A DATA PROCESSING SYSTEM

Yves-Jean Brette, Sevres, France, assignor to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

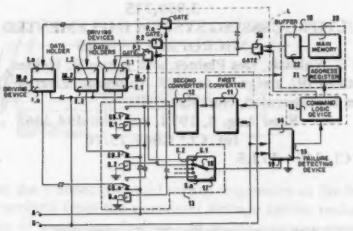
Filed Aug. 30, 1974, Ser. No. 502,169
Claims priority, application France, Sept. 5, 1973, 73.32063
Int. Cl.[2] G06F *1/00, 13/00*
U.S. Cl. 340—172.5 **12 Claims**

1. In data processing system including a computer having a volatile main memory and a plurality of permanent store units, the data processing system being supplied with electrical power from an electrical supply operating at a predetermined low frequency, improved apparatus for transferring data from the main memory to a store unit upon the occurrence of an electrical supply failure, said apparatus comprising:

a first frequency converter of the rotating type connected between the computer and the electrical supply to supply said computer with electrical power at a medium frequency greater than the predetermined low frequency, said first converter being adapted to supply electrical power for a predetermined time period after the electrical supply fails;

a second frequency converter connected to the output of the first converter to reconvert to the electrical supply frequency, the electrical power it receives from the first converter;

detecting means connected to the electrical supply for generating a failure indicating signal in response to a failure of the electrical supply;



command logic means connected to the computer and to said detecting means for controlling transfer towards the store units of the data held in the main memory upon receiving a failure indicating signal; and

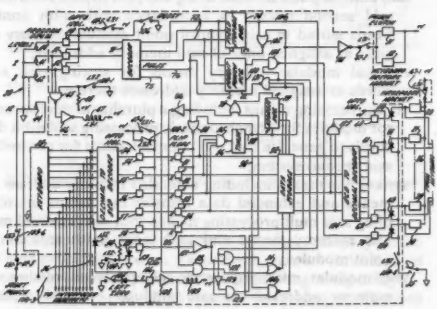
switching means connected, on one hand, to the second converter and to the electrical supply, and, on the other hand, to the store units, to permit a selected store unit to be supplied with electrical power from said second converter, and to the other units to be supplied with electrical power from the electrical supply, whereby data are transferred from the main memory into the selected store unit within the predetermined time period after a supply failure is detected by the detecting means.

3,959,779

LEFT ZERO FILL CIRCUIT

Ross DiGiacinto, Chicago, and Clarence Turek, Glenview, both of Ill., assignors to Specialized Electronics Corporation, Chicago, Ill.

Filed Sept. 30, 1974, Ser. No. 510,142
Int. Cl.[2] G06F *3/00*
U.S. Cl. 340—172.5 **16 Claims**



1. A left zero fill circuit for use with a card keypunch machine for providing a left zero fill capability thereto, said circuit comprising, in combination:

a data memory for storage of integers entered by manual keystrokes,

a field storage register for storing a number indicating the size of the left zero field and successively decrementing said number in response to the same manual keystrokes thereby to determine the number of left zeros remaining in the left zero selected field after said integers are entered,

and means for readout of said data memory under the control of said field storage register to operate the punches of the keypunch machine to punch the left zeros and integers on a card in said machine.

3,959,780

CONTROL DEVICE FOR PRINTING APPARATUS

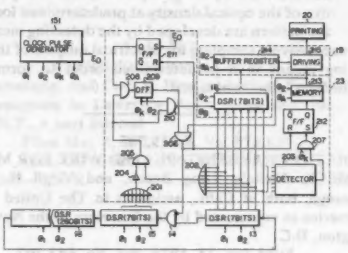
Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 245,074, April 18, 1972, abandoned. This application Apr. 9, 1975, Ser. No. 566,457

Claims priority, application Japan, Apr. 20, 1971, 24901

Int. Cl.² G06F *13/00*

U.S. Cl. 340—172.5 **3 Claims**



1. A printing control device for a printing apparatus, comprising, in combination:

input means for feeding character signals and word positioning signals to distinguish one word from another, each word being constituted by at least one character signal;

memory means coupled to said input means for storing the character signals in the same predetermined order as they are applied to said input means;

means for detecting the word positioning signals each time they are fed from said input means;

control means for reading out the character signals in a manner of word-by-word from said memory means, in response to the detected word positioning signals in the same order as they are stored in said memory means;

printer driving means driven by the outputs fed from said detecting means; and

printer means driven by said driving means for printing characters in a manner of word-by-word, including in each word the characters corresponding to the respective character signals read out by said control means in the predetermined order.

3,959,781

SEMICONDUCTOR RANDOM ACCESS MEMORY

Rustam J. Mehta, Sunnyvale, and Michael Geilhufe, Los Gatos, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Nov. 4, 1974, Ser. No. 520,797

Int. Cl.² G11C *11/40*

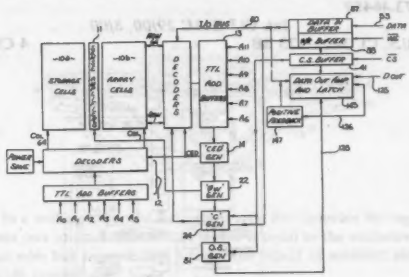
U.S. Cl. 340—173 R **19 Claims**

1. A random access memory comprising:

a plurality of row lines, each row line including a right row line and a left row line;

a plurality of column lines;

a plurality of storage cells, each of said cells comprising a field effect transistor having a gate and a source and drain region, and a capacitive storage means, said gate being coupled to one of said column lines and one of said source and drain regions being coupled to one of said row lines;



a plurality of sense amplifiers disposed in a column such that each of said sense amplifiers interconnects one of said right row lines with one of said left row lines of one of said rows;

an input/output bus disposed along one end of said row lines and coupled to said row lines; and,

a plurality of dummy cells, one coupled to each of said right row lines and each of said left row lines;

whereby said input/output bus communicates with some of said storage cells through said sense amplifiers.

3,959,782

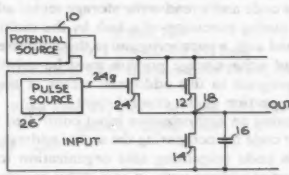
MOS CIRCUIT RECOVERY TIME

William C. Dunn, Scottsdale, Ariz., assignor to Semi, Inc., Phoenix, Ariz.

Filed Dec. 4, 1974, Ser. No. 529,545

Int. Cl.² G11C *11/24, 7/00*

U.S. Cl. 340—173 CA **5 Claims**



5. Apparatus for shortening the recovery time of a signal pulse activated semiconductor circuit comprising a capacitive load comprising

a source of potential,

a first FET device connected between said source of potential and said circuit and having a current carrying capability for continuously supplying leakage charge but not load current thereto,

a second FET device connected between said source of potential and said circuit for supplying load current to said circuit, said second FET device having a current carrying capability for supplying load current to said circuit, and

means for enabling said second FET circuit to conduct current when said circuit is being inactivated after having been activated.

3,959,783

CONTROL STORE UNIT ADDRESSING DEVICE

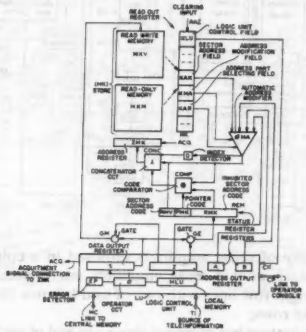
Jean-Louis Fressineau, Les Clayes-sous-Bois; Maurice Hubert, Versailles, and Pierre Hoffmann, Mere, all of France, assignors to Compagnie Internationale pour l'Informatique, Louveciennes, France

Filed Dec. 13, 1974, Ser. No. 532,684

Claims priority, application France, Dec. 27, 1973, 73.46459

Int. Cl.[2] G11C *29/00, 8/00*

U.S. Cl. 340—173 BB 4 Claims



1. In a multi-microprogrammed unit comprising a control store having a read-only storage portion and a read-write storage portion, each portion organized in addressable microprogram sectors, and having a common address register and a common read-out register for said storage portions, a logical unit having a control input connected to an output of the read-out register, a status register controlled from said logical unit, and a control store address forming organization having control and data inputs from outputs of the read-out register and of the logical unit and having an output to said common address register, an addressing device comprising the combination of:

means controlled from the logical unit for writing into said status register a pointer code, a read-only storage sector address code and a read-write storage sector address code when, during execution of a task by the multi-microprogrammed unit, a microprogram in this addressed sector of the read-write storage portion must be substituted to a microprogram in this addressed sector of the read-only storage portion of the control store,

means having an authorization input controlled by the said pointer code for comparing the sector address code in the address code outputting said organization to the read-only sector address code in said status register, and,

means responsive to an identity condition output of said comparator means for substituting in the outputting code from said organization the read-write storage sector code of said status register to the read-only storage sector code in said outputting code for the said common address register.

3,959,784

HIGH SPEED OPTICAL READ-OUT OF DATA STORED IN AN ARRAY

Michael J. Meier, Monrovia, Calif., assignor to Actron, Monrovia, Calif.

Filed Dec. 23, 1974, Ser. No. 535,364

Int. Cl.[2] G11C *7/00, 13/04*

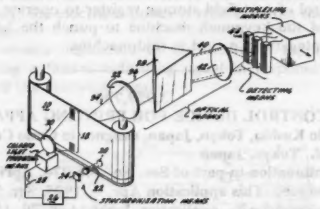
U.S. Cl. 340—173 LM 27 Claims

12. A method for sensing discrete levels of optical density located at predetermined data locations in a known pattern on a moving film, said pattern of locations being repeated on the film in the direction of motion, and for presenting these levels in the form of a time-ordered electrical signal, comprising:

a. detecting the location of the pattern on the moving film;

b. triggering the flashing of an illumination means in response to the detection of the pattern;

c. illuminating the film with the flashes of light from the illumination means;



d. imaging the data location pattern onto a detecting means, whereby the group of electrical outputs indicative of the optical density at predetermined locations in the pattern are developed by the detecting means; and

e. successively sampling the electrical outputs of the detecting means in a predetermined order to form a time-ordered electrical signal.

3,959,785

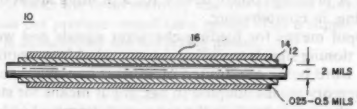
RADIATION HARDENED PLATED WIRE FOR MEMORY

Donald K. Nichols, Long Beach, and Virgil H. Strahan, Orange, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 23, 1975, Ser. No. 543,207

Int. Cl.[2] G11C *11/02;* H01F *27/42*

U.S. Cl. 340—174 TF 7 Claims



1. A plated wire for use in a plated-wire memory comprising:

a non-magnetic, wire substrate,

at least one layer of magnetic, electrically conductive material overlaying said wire substrate; and

an outer layer of non-magnetic, electrically conductive material to a thickness of 2 or 3 times the skin depth penetraton of radiation induced currents overlaying the outer-most layer of said wire substrate.

3,959,786

ISOLATED TWO-WIRE TRANSMITTER

Maghar S. Chana, and Eric A. Hauptmann, both of Rochester, N.Y., assignors to Rochester Instrument Systems, Inc., Rochester, N.Y.

Filed June 3, 1975, Ser. No. 583,479

Int. Cl.[2] G08C *19/02*

U.S. Cl. 340—210 14 Claims

1. An isolated two-wire transmitter having two input terminals to be connected to a voltage signal source and two output terminals to be connected to a d.c. power source, said transmitter comprising:

power means connected to said output terminals to provide a source of regulated d.c. power at a predetermined voltage, and pulse means connected to said power means

to provide a source of substantially equally timed negative and positive electrical pulses;

a first amplifier means having input and output terminals whose input terminals are connected to said transmitter input terminals and which functions to provide a current output which is proportional to the voltage of said voltage signal source;

a current transformer having primary and secondary windings, whose primary winding has at least three taps, its center tap being connected in series with and controlled by the output of said first amplifier means and its other taps being connected to said pulse means;

an a.c. to d.c. network means connected to the secondary winding of said current transformer to provide a proportional voltage which is proportional to the said current output applied to said primary winding;

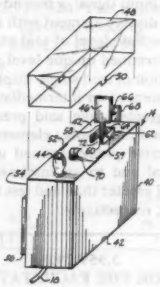
a second amplifier means having input and output terminals, said input terminal being connected to said a.c. to d.c. network means for its control, and its output terminal being connected in series with said transmitter output terminals to provide an output current to said transmitter which is proportional to said proportional voltage and is thereby proportional to the voltage of said voltage signal source.

3,959,787

REFRIGERATION ALARM

Helen Messmann, and Carl T. Pfeufer, both of Center Point, Tex., assignors to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed May 8, 1975, Ser. No. 575,839
Int. Cl.² G08B *21/00*; F25B *49/00*
U.S. Cl. 340—227 R **2 Claims**



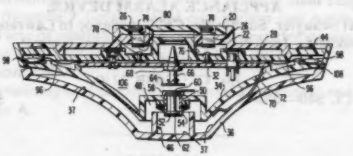
1. A temperature alarm apparatus for a refrigerated container having a shelf within said container comprising an electrical temperature sensor having a hook means configured for engaging an edge of said shelf for suspending said sensor from said shelf within said container, a housing having magnetic means for affixing said housing to the outside of said container, cable means for electrically connecting said sensor to said housing, a buzzer carried by said housing, means within said housing for electrically energizing said buzzer in response to said sensor, a flag pivotly mounted on said housing, said flag having a deployed angular position and a cocked angular position, elastic means urging said flag to the deployed position, electrically releasable means for holding said flag in the cocked position, said releasable means including a solenoid electrically connected to said energizing means for deploying said flag in response to said sensor.

3,959,788

IONIZATION-TYPE FIRE DETECTOR

William C. Tipton, Newark; Michael Suchomel, Mountainside, and John Z. Taran, Morristown, all of N.J., assignors to General Signal Corporation, Rochester, N.Y.

Filed May 10, 1974, Ser. No. 468,950
Int. Cl.² G08B *17/10*; H01J *39/28*
U.S. Cl. 340—237 S **16 Claims**



1. In a ceiling-mounted ionization type fire detector having at least one ionization chamber which is open to the entrance of aerosols but is protected against the effect of ambient air currents comprising:

an inner shell member and an outer shell member,

the outer surface of said inner shell member and the inner surface of said outer shell having generally similar geometric shapes and being supported in superimposed generally parallel spaced relationship to each other and with said inner shell closer to the ceiling than said outer shell,

said inner and outer shell members both having their opposing surfaces inclined inwardly and downwardly over a substantial portion thereof from their substantially common peripheral spaced edges adjacent the ceiling towards their central portions which are more distantly spaced from the ceiling,

said inner and outer shells defining at their said common edges an aperture for the passage of aerosols, but with said outer shell being otherwise substantially imperforate,

a chamber formed between said inner and outer shells substantially at their center and having a surrounding wall,

means for ionizing the air in said chamber,

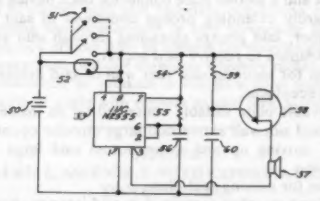
and means responsive to the change in electrical conductivity in said chamber in the presence of aerosols for providing an alarm signal.

3,959,789

CREDIT CARD MONITOR

Francis M. McGahee, 2437 Doctors Lake Drive, Orange Park, Fla. 32073

Filed Feb. 21, 1975, Ser. No. 551,929
Int. Cl.² G08B *7/00*
U.S. Cl. 340—280 **13 Claims**



1. A document holder, comprising:

a plurality of separators adapted to hold documents there between, said separators constructed from electrically nonconductive material and incorporating electrically conductive members on facing surfaces positioned to form normally closed electrical contact pairs, said contact pairs adapted to be held open by documents inserted there between;

a switching means comprised of said contact pairs connected in electrical parallel;

a power source electrically connected to said switching means;

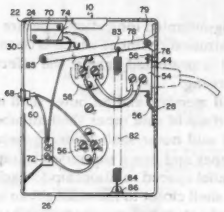
a time delay means responsive to said switching means; and

an alarm means responsive to said time delay means.

3,959,790
APPLIANCE ALARM DEVICE

Daniel Schuyler, Sunnyvale, Calif., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Mar. 14, 1975, Ser. No. 558,263
Int. Cl.² G08B 21/00
U.S. Cl. 340—280 **5 Claims**



1. An appliance alarm device communicating between a cord assembly of an appliance having an end plug and a wall receptacle having at least two sockets joined to a power source, which comprises:

a. a rectangular shaped housing having an interior chamber, a base, a pair of upward extending sidewalls, a rear wall, an upper end, a movable front wall hingably communicating with said base, said rear wall having two pairs of slot apertures therethrough and a central circular hole therethrough, one said sidewall having a large circular opening therethrough, and said front wall having a first circular aperture therethrough;

b. a lock assembly contained in said circular aperture and communicating with said upper end of said housing;

c. a female receptacle contained in said interior chamber, said female receptacle aligned with said large circular opening and adapted to receive said end plug;

d. a first and a second male connector each having a pair of outwardly extending prongs contained in said interior chamber, said prongs extending through said apertures and adapted to receive said socket;

e. means for securing said rear wall of said device to said wall receptacle;

f. a movable plate slidably contained on an inside face of one said sidewall above said large circular opening, said plate moving up and down across said large circular opening;

g. means for moving said plate;

h. an alarm member contained in said interior chamber;

i. an electrical switching member having a movable contact arm contained in said interior chamber;

j. means for mechanically interrelating said means for moving said plate and said contact arm;

k. a first series circuit of first said male connector, said alarm member, and said switching member; and

l. a second series circuit of said female receptacle and second said mule connector.

3,959,791
DIGITAL DISPLAY SYSTEMS

Makoto Takahashi, Sagamihara, and Osamu Ichihashi, Machida, both of Japan, assignors to Yashica Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1974, Ser. No. 455,138
Int. Cl.² G08B 5/36
U.S. Cl. 340—324 R **12 Claims**

LED	1	2	3	4	----	n-2	n-1	n
$V_1<V_{in}$	○	×	×	×	----	×	×	×
$V_2<V_{in}<V_1$	○	○	×	×	----	×	×	×
$V_3<V_{in}<V_2$	×	○	×	×	----	×	×	×
$V_4<V_{in}<V_3$	×	○	○	×	----	×	×	×
$V_5<V_{in}<V_4$	×	×	○	×	----	×	×	×
$V_{n-1}<V_{in}<V_{n-2}$	×	×	×	×	----	○	○	×
$V_n<V_{in}<V_{n-1}$	×	×	×	×	----	×	○	×
$V_{in}<V_n$	×	×	×	×	----	×	×	○

1. In a digital display system of the type wherein a plurality of n luminous display elements are arranged in an orderly manner for selective operation in accordance with the value of an analogue input signal and where *n* is an integer equal to or greater than three (3); the improvement which comprises means for operating each of said display elements in response to a unique predetermined level of said analogue input signal, means for simultaneously operating display elements between the first and the nth element in response to a plurality of intermediate levels of said analogue input signal between said predetermined unique levels, each of said display elements between the first and nth display elements being responsive to three different values of the analogue input signal, said three different values of the analogue input signal providing a first display by a single display element at a predetermined unique level of the analogue input signal, a second display by a combination of said single display element with an adjacent display element at an intermediate level of said analogue input signal less than said predetermined unique level, and a third display by another combination of said single display element with an adjacent display element at an intermediate level of said analogue input signal greater than said predetermined unique level, and said first and nth display elements being responsive both to their respective predetermined unique level of the analogue input signal and to an intermediate level of said analogue input signal greater than and less than their predetermined unique levels, respectively.

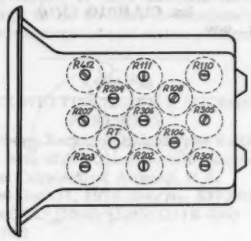
3,959,792
DEVICE FOR THE FACILITATION AND SIMPLIFICATION OF THE ADJUSTMENT OF RESONATORS OF AN ANSWERING DEVICE IN A MICROWAVE RAILROAD VEHICLE IDENTIFICATION SYSTEM

Bernhard Hildebrandt, Hochbrueck near Garching, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 9, 1974, Ser. No. 468,391
Claims priority, application Germany, June 15, 1973, 2330580
Int. Cl.² G01S 9/56
U.S. Cl. 343—6.5 SS **3 Claims**

1. In a microwave transmission system in which a number of digits as an information represent an alphanumeric symbol to identify a location of, for example, a railroad vehicle, and in which the information is, in each case, periodically switched through and transmitted in a transmission band, the information being transmitted from an interrogation device and received again selectively frequency modulated by the resonators of an answering device, the improvement therein comprising:

a device for facilitating and simplifying adjustment of the resonators including means for receiving the information comprising a high frequency line having an electromagnetic field and receiving the digits in separate successive frequency bands within the transmission band and in a



first sequence which differs from the digit sequence of the information, the resonators being optimally coupled to said high frequency line, and a receiving branch in said device including a digit sorter for arranging the digits received in said first sequence into the digit sequence of the information.

3,959,793

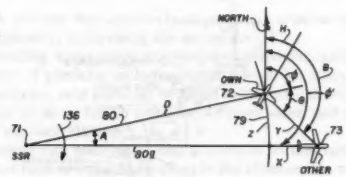
PROXIMITY INDICATION WITH MEANS FOR COMPUTING THE DISTANCE FROM AN OWN STATION TO AN INTERROGATING SECONDARY SURVEILLANCE RADAR

George B. Litchford, Northport, N.Y., assignor to Litchstreet Co., Northport, N.Y.

Continuation-in-part of Ser. No. 371,883, June 20, 1973, Pat. No. 3,858,210, which is a division of Ser. No. 180,578, Sept. 15, 1971, Pat. No. 3,757,324. This application Aug. 7, 1974, Ser. No. 495,271

Int. Cl.² G01S 9/56

U.S. Cl. 343—6.5 R **20 Claims**



19. A method of determining at an own station the distance D to a secondary surveillance radar (SSR), comprising the steps of:

a. receiving groups of interrogation signals from said SSR during the dwell time of the main beam of said SSR on said own station;

b. receiving groups of reply signals transmitted from an other transponder station in response to interrogation signals received from said SSR at said other transponder station during the dwell time of said main beam on said other transponder station;

c. measuring the time interval between reception at said own station of successive groups of one of said signals to determine the main beam rotation period of said SSR;

d. determining, in accordance with said main beam rotation period and the times of reception of said groups of interrogation signals and said groups of reply signals, the angle A between the lines of position of said own station and said other transponder station from said SSR;

e. measuring the interval between an interrogation signal from said SSR when it is received, or a simulation thereof, and a corresponding reply signal received from said other transponder station, and determining from said interval the sum X + Y of the differential range X to said SSR and the slant range Y between said own station and said other transponder station;

f. determining the slant range Y between said own station and said other transponder station;

g. determining from the sum X + Y and the slant range Y the distance Z between said own station and a point on said line of position of said other transponder station that is the same distance D from said SSR station as said own station; and

h. determining said distance D from said distance Z and said angle A.

3,959,794

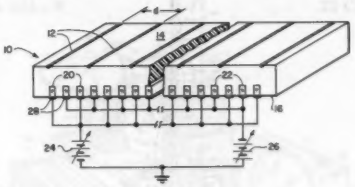
SEMICONDUCTOR WAVEGUIDE ANTENNA WITH DIODE CONTROL FOR SCANNING

Metro M. Chrepta, Neptune, and Harold Jacobs, West Long Branch, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 26, 1975, Ser. No. 617,211

Int. Cl.² H01Q 3/26

U.S. Cl. 343—701 **11 Claims**



1. A single line scanner comprising:

a semiconductor waveguide of rectangular cross section adapted to propagate wave energy in the E_{11}^y mode along a prescribed axis transverse to the dimensions of said cross section;

said waveguide having top and bottom surfaces parallel to said axis;

a plurality of spaced parallel radiator elements on said top surface transverse to said prescribed axis in the path of said propagated wave energy;

means affixed to another surface to prevent outward radiation therefrom as wave energy is propagated along said waveguide; and

means in circuit with said radiation prevention means for changing the wavelengths in said waveguide at a given frequency of operation to control the wavelength spacing between said radiator elements whereby radiated energy is reinforced to produce a radiation lobe pattern at a prescribed angle with respect to said propagating axis.

3,959,795

AERIAL ASSEMBLY WITH COMBINATION TOWER-GUIDE

Robert J. Foster, 515 S. 56th St., Omaha, Nebr. 68106

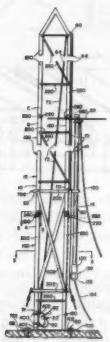
Filed Aug. 7, 1972, Ser. No. 278,749

Int. Cl.³ H01Q 1/10, 1/12

U.S. Cl. 343—883 **5 Claims**

1. An aerial assembly comprising an elongated upright tower, said tower having a plurality of upright assembled sections disposed one above the other, each section comprising at least three elongated horizontally spaced upright corner members and transverse members transverse to and intercon-

necting each of said at least three upright members, the said upright members of each said section each being disposed in substantial alignment with and connected to one of the upright members of an adjacent section respectively, said upright members defining corners of the periphery of the tower when the tower is seen in any transverse cross-section, an aerial carriage, an aerial means capable of receiving and conducting radio signals, means attaching said aerial means to said carriage, said aerial carriage being slidably attached directly to said tower and slidable upwardly and downwardly along said tower whereby said tower is itself a strong guide track for said carriage, said three upright corners members of said tower itself providing the guiding surfaces for said carriage, said carriage surrounding a sufficiebt part of the transverse periphery of said tower for firmly holding said carriage slidably on said tower, said carriage extending around at least three of the corner members of said tower, an elongated upright aerial standard, said tower serving the first purpose of providing the main upholding strength of said assembly and also serving the second purpose of providing a guide track for said carriage, said upright corner members having outer surfaces sufficiently free of obstruction to passage of said carriage along said tower as to permit said carriage to move along at least one-third of



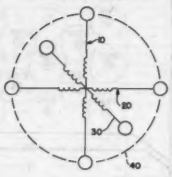
the length of said tower, and carriage raising and lowering means on said tower and connected to said carriage for moving said carriage upwardly on said tower, and said carriage raising and lowering means having a controllable portion within reach of an operator standing in a position with his feet adjacent a lower one-third portion of said tower whereby said operator while in said position can operate said controllable portion and thereby cause raising and lowering of said carriage along at least the majority of the height of said tower and also to the upper one-third portion of said tower, said raising and lowering means comprising a pulley attached to an upper portion of said tower, an elongated flexible member attached to said carriage and extending up and over said pulley and down said tower, said raising and lowering means comprising a winch attached to said flexible member, said winch having a winch-frame, means attaching said winch frame in a fixed relationship to said tower, the adjacent ends of each two adjacent aligned upright corner members having holes extending transversely therethrough and being connected by securing means having parts protruding from said holes respectively on the outer sides of said corner members respectively, said carriage having open spaces extending vertically therethrough in which said protruding parts of said securing means are received as said carriage freely passes thereacross.

3,959,796

SIMULATION OF LORENTZ PLASMA BY RANDOM DISTRIBUTION OF INDUCTIVELY-LOADED DIPOLES

George Merkel, Springfield, and John F. W. Dietz, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 5, 1974, Ser. No. 529,878
Int. Cl.² H01Q *15/10*
U.S. Cl. 343—909 **5 Claims**



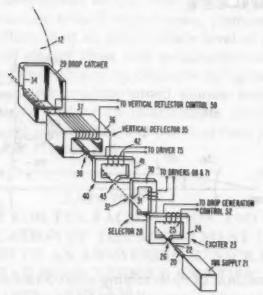
1. Apparatus for simulating an artificial dielectric in a plasma space, which comprises means for simulating a Lorentz plasma in said plasma space which comprises a plurality of inductively-loaded dipole scatterers each of which is individually encased in a nonpermeable pellet, the plurality of pellets containing respectively said plurality of inductively-loaded dipole scatterers being randomly distributed and oriented throughout said plasma space.

3,959,797

INK JET PRINTER APPARATUS AND METHOD OF PRINTING

Donald F. Jensen, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1974, Ser. No. 533,414
Int. Cl.² G01D *15/18*
U.S. Cl. 346—1 **7 Claims**



1. A method of printing characters on a record medium with individual drops of ink comprising

projecting a sequence of uniformly-spaced ink drops in a first direction toward said record medium while effecting relative motion between the record medium and said stream in a second direction orthogonal to said first direction,

said drops in said sequence being at least equal in number to the number of coordinate intercepts of a predetermined rectilinear matrix pattern, and

forming data markings on said record medium with said drops in accordance with a predetermined data pattern including

selectively removing unwanted drops from said sequence to cause blanks at predetermined coordinate intercepts of said matrix pattern,

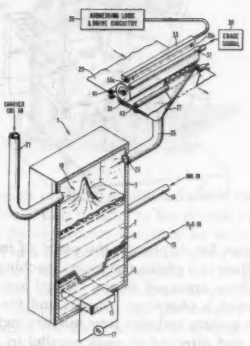
deflecting the remaining drops from said sequence in a third direction orthogonally to said first and second directions so as to cause said remaining drops to be directed to impact predetermined intercept locations of said matrix pattern, and

altering the deflection of certain of said remaining drops in either said second or third direction for causing said certain drops to be directed to locations intermediate coordinate intercepts of said matrix pattern.

3,959,798
SELECTIVE WETTING USING A MICROMIST OF PARTICLES

Frederick Hochberg, Yorktown Heights, and Keith S. Pennington, Somers, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1974, Ser. No. 537,801
Int. Cl.² G01D *15/06*; **G11B** *9/00*
U.S. Cl. 346—74.1 **34 Claims**



1. A process for selectively depositing particles on a medium therefor, comprising the steps of:

generating a magnetic micromist of particles, said micromist of particles including a carrier gas for carrying said particles, said particles being of sufficiently small particle size so as to fail to wet said medium when said medium is exposed thereto;

exposing said medium to said micromist so that said micromist fails to wet said medium in the absence of a magnetic field gradient thereat; and

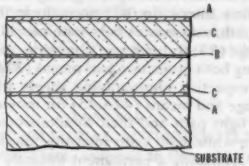
providing a magnetic field gradient at said medium so as to thereby cause said micromist to locally wet said medium in accordance with said field gradient.

3,959,799
INFORMATION STORAGE BY LASER BEAM INITIATED REACTIONS

Richard J. Gambino, Yorktown Heights; Frederic Holtzberg, Pound Ridge; Ralph R. Ruf, New City, and Benjamin Welber, Chappaqua, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 9, 1974, Ser. No. 504,602
Int. Cl.² G01D *15/34*
U.S. Cl. 346—135 **1 Claim**

1. A low threshold high density storage medium comprising adjacent thin layers of at least two materials which upon heating form a reaction product having optical, magnetic, or electrical properties different from the corresponding properties of said materials respectively said at least two materials being selected from the group consisting of Al, Se, Zn, Bi, As, Mn and In - Ga; and including a thin barrier layer intermediate said at least two material layers and comprising a substance different from said materials for preventing the spontaneous

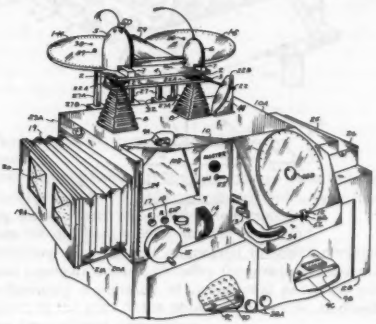


reaction of said materials in the absence of said heating; and wherein one of said at least two materials is intermediate double layers of said other material layers and said barrier layer.

3,959,800
UNITARY PHOTOGRAPHIC LETTERING AND DISPLAY TYPOGRAPHY DEVICE

Murray Friedel, 18356 W. Dixie Highway, North Miami Beach, Fla. 33160

Continuation-in-part of Ser. No. 473,877, May 28, 1974, abandoned. This application Feb. 27, 1975, Ser. No. 553,893
Int. Cl.² B41B *13/00*; **G03B** *17/06*
U.S. Cl. 354—5 **22 Claims**



1. A unitary master and slave photographic lettering and display typography composing device comprising a base cabinet (**28**), a main housing (**10A**) supported thereon, a master light projection housing (**5**) and a slave light projection housing (**6**) mounted on said main housing (**10A**) and said base cabinet (**28**), each projection housing having a pair of condensing lenses (**5B, 5C** and **6B 6B**) light projection lamps (**5A, 6A**) therein, a pair of identical character font disks (**1-M, 1-S**), rotatably mounted above the font disks base assembly (**4**), each font disk having circularly located transparent font characters (**85, 86**) mounted in a surrounding area of opaque material in each said font disk, a condenser lens means (**5B, 5C** and **6B, 6B**) mounted in each light projection housing (5,6) between its light projection lamp and its font character disk, a manualy controllable single character selector dial (**11**), means (**31**) connecting said selector dial (**11**) to each said identical font character disk (**1-M, 1-S**) for simultaneous rotation thereof to place its selected transparent character (85,86) in the light path from its said respective projection lamp, a projection lens menas (**22A**) mounted in each light path, a master wetted light sensitive photographic sheet (**93D**) holder base unit (**94**) of a tray base unit (**91**) for containing a wetted photographic sheet (**93D**) and a photographic developer solution (**96**) in the light path of said master projection housing (**5**), a slave dry light sensitive photographic sheet

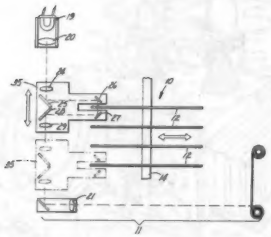
(93B) holder base unit (95) of said tray base unit (91) in the light path of said slave projection housing (6), said projection lens means (22A) being between said photographic sheets 93D, 93B) and said selected transparent characters (85,86), the master wetted sheet (93D) being insensitive to yellow light, a yellow filter strip (42) normally in the master projection light path, said master light path providing a visible temporary image (93) through said filter strip, means (22,22B,49) for adjusting both projection lens means (22A) simultaneously on their respective photographic sheets while viewing said visible image and means (42A,43) for moving said filter strip out of its light path and then simultaneously exposing both sheets to a white light path intensity, the master projection light path producing a permanent instantly visible individual black character image (93A) on its master wetted sheet (93D) while the slave projection light path produces a latent character image on said slave photo sheet (93B) for subsequent development of all latent image characters composed and exposed thereon.

3,959,801

DYNAMIC OPTICAL FONT AVAILABILITY SYSTEM

Thomas A. Booth, Flanders, N.J., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Apr. 10, 1975, Ser. No. 566,786
Int. Cl.² B41B 17/06
U.S. Cl. 354—7 **3 Claims**



1. A font storage and optical retrieval system for a photocomposition machine, comprising:

a support frame;

a plurality of indicia storage disc members mounted in superposed relationship, and means for rotating said disc members about a common axis, each said disc having at least one data set in a circular track path;

a projection system mounted on said support frame, means mounting said indicia storage discs for movement of said axis in a path perpendicular to said axis into a first station position a distance from said projection system greater than the diameter of the largest disc and into selected ones of a plurality of relative positions with respect to said projection system wherein said projection system is adjacent a selected data set track path; and

means for shifting said projection system in the direction of said axis to place a selected one of said discs into alignment with said projection system;

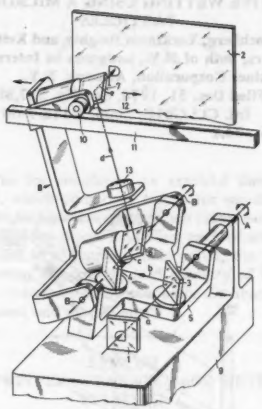
whereby, said plurality of discs may be removed from interface with said projection system, shifted to align a substitute disc, and repositioned to select various data sets at will.

3,959,802

MEANS FOR RECORDING CHARACTER IMAGES IN SIDE BY SIDE RELATIONSHIP IN A PHOTOCOMPOSING MACHINE

Michael Plaot, Eschborn, Germany, assignor to Mergenthaler Linotype GmbH, Frankfurt, Germany

Filed Mar. 10, 1975, Ser. No. 556,830
Claims priority, application Germany, Mar. 12, 1974, 2411721
Int. Cl.² B41B 17/18
U.S. Cl. 354—12 **3 Claims**



1. Apparatus for displacing the place of imaging on a recording medium in a photocomposing machine with the use of a mirror system arranged in the optical axis of an imaging system between a character support and the recording medium, which system includes four mirrors inclined 45° to the optical axis and directed in pairs parallel to each other, the position of at least one mirror with respect to the recording medium as well as the positions of the mirrors with respect to each other being variable for displacement of the place of imaging in particular along a line in such manner that the length of the optical path between the recording medium and the mirror facing the character support remains constant, characterized in that each pair of parallel directed mirrors (3, 4 and 6, 7 respectively) are connected on a common support (5 and 8 respectively) to form individual periscopes, that the first periscope (3, 4, 5) facing the character support (1) is swingable around its entrance axis (*a*) so that, regardless of its position, it is always directed, to the same position on the character support (1), that the second periscope (6, 7, 8) which faces the recording medium (2) is swingable about its optical entrance axis (*c*) which coincides with the exit axis of the first periscope in such a manner that the longitudinal axes (*b*, *d*) of the periscopes are swingable with respect to each other.

3,959,803

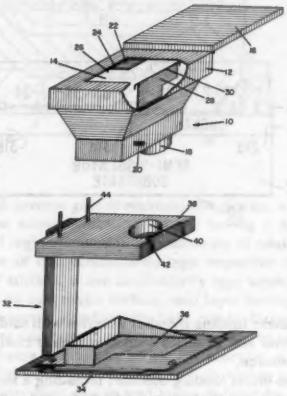
INSTANTANEOUS PHOTOGRAPHY CAMERA

Fred D. Marvel, 1417 E. 2nd St., Tulsa, Okla. 74101

Filed Dec. 9, 1974, Ser. No. 530,599
Int. Cl.² G03B 17/00
U.S. Cl. 354—105 **5 Claims**

1. An improved instantaneous photography camera for use in the manufacture of photographic identification cards of the type in which one or more masks are provided within the camera box of the camera to allow only a portion of a photosensitive film to be sequentially exposed to an image containing credit information and to an image of the subject of the credit ientification, the improvement comprising:

a. a first mask pivotally positioned within the camera with its pivotal axis perpendicular to the focal axis of the lens of the camera and being formed of adequate weight so as to hang in a vertical position when the camera box is held having its lens axis parallel to the horizontal of the ground and so as to normally cover a portion of the photosensitive film but allow that portion of the photosensitive film to be exposed when the camera lens is directed in a vertical position towards the ground; and



b. a second mask pivotally positioned within the camera box with its pivotal axis parallel to the pivotal axis of the first mask and being counter-weighted so as to be normally positioned in a horizontal position when the camera box is held having its lens axis parallel to the ground and so as to normally expose a portion of the photosensitive film but allow that portion of the photosensitive film to be covered when the camera lens is directed in a vertical position toward the ground.

3,959,804

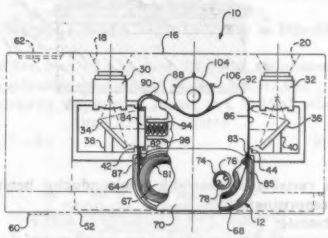
STEREOSCOPIC CAMERA

Seton I. Rochwite, 1234 Collins Lane, San Jose, Calif. 95129

Filed Apr. 21, 1975, Ser. No. 570,258

Int. Cl.² G03B *35/08*

U.S. Cl. 354—116 **14 Claims**



1. In a stereoscopic camera having a pair of spaced-apart lenses mounted in a case with optical means for transposing light images from the lenses and directing the transposed images toward each other along coincident axes, including means forming a cavity within the case, a film cartridge formed with external dimensions for insertion into and removal from the cavity, said film cartridge including a housing forming a chamber for containing a supply of sensitized film strip, means forming a film strip transport track for guiding said film strip from the supply chamber and along a path externally of the housing whereby a first portion of the film strip is disposed orthogonal across the axis of the transposed light image from one of said lenses and another portion of the film strip is disposed orthogonally across the axis of the transposed light path from the other of said lenses, and means for advancing said film strip along the transport track for stereoscopically exposing a series of spaced portions of the film strip to the light images.

3,959,805

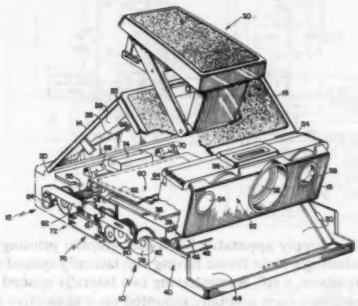
ADJUSTABLE DUAL ACTION SWITCH

Igor Blinow, Millis, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 2, 1974, Ser. No. 494,198

Int. Cl.² G03B *17/00*

U.S. Cl. 354—202 **11 Claims**



1. A photographic camera comprising:

a housing;

exposure control circuitry for performing a variety of operational programs for defining a photographic cycle including the exposure of photosensitive material;

means for initiating a photographic cycle; and

a switching arrangement connected to select portions of said exposure control circuitry for precisely sequentially influencing a plurality of operational programs subsequent to the start of the photographic cycle, said switching arrangement comprising:

a first pair of electrical contacts;

a second pair of electrical contacts;

means for electrically isolating and supporting said first pair and said second pair of electrical contacts from each other, said isolating and supporting means including means for spacially separating said first and said second pair of electrical contacts from each other a given distance;

actuator means movable between a first position, in which it engages one contact of said first pair of electrical contacts, and a second position, in which it engages one contact of said second pair of electrical contacts;

first adjusting means for adjusting movement of said isolating and supporting means as well as said first and second pair of electrical contacts for predeterminely locating either said first pair of electrical contacts relative to said actuator means at its first position or said second pair of electrical contacts relative to said actuator means at its said second position; and

second adjusting means, associated with said first pair of electrical contacts or said second pair of electrical contacts for adjusting said first pair of contacts relative to said actuator means when said actuator means is in said second position or said second pair of contacts relative to said actuator means when said actuator means is in said first position whereby said actuator

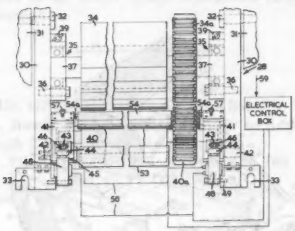
means operates said first and second pair of contacts in a predetermined sequence as said actuator means moves from said first position to said second position.

3,959,806

WATER SUPPLY APPARATUS FOR PRINTING MACHINES

Samuel P. Ogilvie; Lorne F. Bolton, and Charles W. Dingman, all of Stratford, Canada, assignors to The Beacon Herald of Stratford, Limited, Stratford, Canada

Continuation of Ser. No. 312,552, Dec. 6, 1972, abandoned. This application Sept. 13, 1974, Ser. No. 505,892
Claims priority, application Canada, Oct. 3, 1972, 153101
Int. Cl.² G03B *13/00*
U.S. Cl. 354—297 **12 Claims**



1. Water supply apparatus for a lithographic printing machine including a main frame having two laterally spaced main frame members, a sub-frame having two laterally spaced sub-frame members each pivotally mounted on a respective main frame member, a laterally extending water transfer roller rotatably mounted between the main frame members, a laterally extending water pick up roller rotatably mounted between the sub-frame members, a first gear secured to the transfer roller, a second gear secured to the pick-up roller, the second gear meshing with the first gear whereby rotation of the transfer roller causes rotation of the pick-up roller, a laterally extending pressure roller rotatably mounted between the sub-frame members and in contact with the pick up roller, the pressure roller being rotatable by the pick-up roller, a water tray into which the pick up roller projects, and means for pivoting the sub-frame to position the pick up roller in or out of contact with the transfer roller, the first and second gears having teeth sufficiently long to ensure that the first gear meshes with the second gear whether the pick-up roller is in or out of contact with the transfer roller so that the pick-up roller and the pressure roller rotate continuously with rotation of the transfer roller, the main frame being attachable to a printing machine to cause engagement of the transfer roller with a roller of the printing machine to cause rotation of the transfer roller by rotation of the printing machine roller to enable water to be transferred from the transfer roller to a lighographic printing plate.

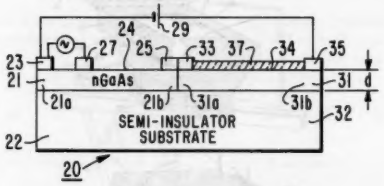
3,959,807

PLANAR TRANSFERRED ELECTRON DEVICE WITH INTEGRAL NONLINEAR LOAD RESISTOR

Chainulu Lakshminarasimha Upadhyayula, East Windsor, and Subrahmanyam Yegna Narayan, Belle Mead, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,020
Int. Cl.² H01L *27/26;* H03F *1/36*
U.S. Cl. 357—3 **5 Claims**

1. In a planar transferred electron logic device of the type comprising a first relatively broad planar body of material having a first conductive terminal near one end and a second conductive terminal near the opposite end and a gating terminal spaced near said first terminal, said material having a doping density and a length and thickness selected such that said body is characterized by a transfer of electrons from a high to a low mobility sub-band and the formation of domains upon the application of an electric field above threshold, means connectable to a bias source for applying an electric field across said first and second terminal with a first value slightly below that of threshold, said gating terminal being responsive to a signal above a given level causing said transferred electron effect and domains to form, the improvement therewith comprising:



a non-linear loading member in series with said first body of material and in series with said means connectable to a bias source,

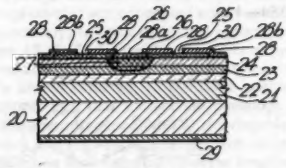
said non-linear loading member including a second body of material like that of said first body and a dielectric medium adjacent to said second body of a relative dielectric constant sufficient to cause said second body to present a current saturation at the electric fields above said first value.

3,959,808

VARIABLE STRIPE WIDTH SEMICONDUCTOR LASER

Frederick David King, Smith Falls, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed Sept. 19, 1974, Ser. No. 507,453
Int. Cl.² H01S *3/19;* H01L *29/161*
U.S. Cl. 357—18 **5 Claims**



1. A variable stripe width semiconductor heterojunction laser comprising:

a substrate;

two sequential layers of semiconductor material of opposite polarity on said substrate, to form a heterojunction;

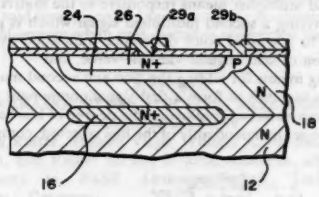
a contact stripe on an outer layer of said device for the application of a forward bias to said heterojunction to produce a lasing region in said device; and

at least one further contact on said outer layer and adjacent to said contact stripe for the application of a reverse bias to produce a depletion region, such that the current spread from said contact stripe in said device is reduced to produce a current density in said lasing region above a threshold value.

3,959,809
HIGH INVERSE GAIN TRANSISTOR

David F. Allison, Los Altos, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed May 10, 1974, Ser. No. 468,939
Int. Cl.² H01L 29/06, 29/72
U.S. Cl. 357—34 3 Claims

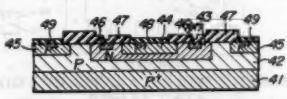


1. In a high inverse gain semiconductor device, a one conductivity type semiconductor substrate having a major surface, a buried region formed in said substrate of relatively high concentration of one conductivity type impurities extending to said major surface, a one conductivity type semiconductor layer formed on said major surface, said layer having a planar surface, an opposite conductivity base region formed in said layer overlying said buried region and extending to said planar surface and being defined by a first PN junction, a one conductivity additional region formed entirely within said opposite conductivity base region and being defined by a second PN junction and extending to said surface to form a base region of a relatively uniform narrow width extending to said planar surface with the areas of the first and second PN junctions overlying said buried regions being substantially of the same size said base region having a portion thereof of greater width of said planar surface to form a contact region for said base region, a insulating layer formed on said planar surface, lead means carried by said insulating layer and extending through said insulating layer and making contact to said contact regions of said base region and said additional region, said layer, base and additional region forming a bilateral transistor capable of substantial forward gain using said additional region as an emitter and said layer as a collector and capable of relatively high inverse gain using said additional region as a collector and said layer as an emitter.

3,959,810
METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE AND THE SAME

Takanori Takeda, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Division of Ser. No. 760,433, Sept. 18, 1968, abandoned. This application June 18, 1970, Ser. No. 57,890
Claims priority, application Japan, Oct. 2, 1967, 42-63057
Int. Cl.² H01L 29/34
U.S. Cl. 357—52 2 Claims

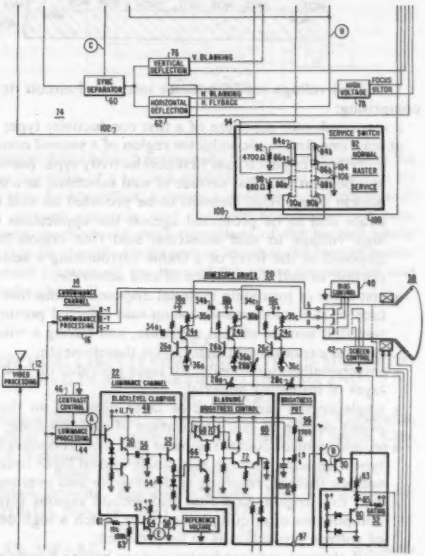


1. A PNP semiconductor device comprising:
a P-type collector region having a principal surface;
an N-type base region having a principal surface;
a PN junction formed between said collector region and said base region;
a P type emitter region formed in one portion of the principal surface of said base region;
an N type highly doped region formed in the other portion of the principal surface of said base region;
a first silicon oxide film deposited from vapor phase to cover at least the surface of said P type emitter region;
a second silicon oxide film thermally grown from the substrate to cover at least the surface of said base region; and
an electrode fitted to the surface of said highly doped region.

3,959,811
SET-UP ARRANGEMENT FOR A COLOR TELEVISION RECEIVER

Robert Loren Shanley, II, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 23, 1975, Ser. No. 580,685
Int. Cl.² H04N 9/62, 5/14, 5/16
U.S. Cl. 358—10 14 Claims



12. In a television signal processing system of the type including signal translating means for deriving synchronizing signals and video signals, said video signals including periodic blanking pulses in the direction of signals corresponding to the black tone of an image reproduced from said video signals, each of said blanking pulses formed by a pedestal level and a synchronization pulse tip having a time duration less than the time duration of said pedestal level, superimposed on said pedestal level so as to leave a front and a back portion of said pedestal level, and signals representing image information disposed between said blanking pulses, and means for deriving from said synchronization signals horizontal synchronization pulses and horizontal flyback signals, in time relation to said synchronization pulse tips, an apparatus, comprising:
a source of said video signals coupled to a first circuit point;
means for utilizing said video signals coupled to a second circuit point;
capacitive means for capacitively coupling said video signals between said first and second circuit points;
a source of reference voltage having an output terminal;
a unidirectional coupling device direct current coupled between said output terminal and said second circuit point and poled to charge, when conducting, said capacitive means toward said pedestal level; and

means coupled to said unidirectional coupling device for rendering said unidirectional coupling device nonconductive except during the front and back portions of said pedestal level.

3,959,812

HIGH-VOLTAGE SEMICONDUCTOR INTEGRATED CIRCUIT

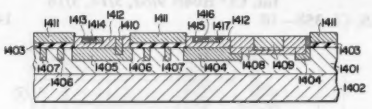
Ichiro Imaizumi, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Feb. 26, 1974, Ser. No. 445,899

Claims priority, application Japan, Feb. 26, 1973, 48-22065; Apr. 11, 1973, 48-40432; Aug. 10, 1973, 48-89304

Int. Cl.² H01L *29/743, 27/04, 29/04, 29/06*

U.S. Cl. 357—48 **6 Claims**



1. A high-voltage semiconductor integrated circuit device comprising:

a semiconductor substrate of a first conductivity type;

at least one first semiconductor region of a second conductivity type opposite said first conductivity type, provided in a portion of a first surface of said substrate, as a component of a circuit element to be provided on said substrate and to be protected against the application of a high voltage to said substrate, said first region being disposed in the form of a frame surrounding a selected portion of said first surface of said substrate;

a first layer of insulating material disposed on the first surface of said substrate including said selected portion of said first surface of said substrate, and having a window portion exposing said first region therebeneath;

a polycrystalline semiconductor layer provided on said first layer of insulating material;

a single crystal semiconductor layer disposed on the exposed portion of said first surface of said substrate;

a second semiconductor region of said second conductivity type extending through said single crystal layer from the surface thereof, reaching said substrate and overlapping said first region, said first and second regions forming components of circuit elements for which a high degree of voltage protection is to be provided;

circuit element semiconductor regions having a prescribed degree of tolerance to the application of a low voltage thereto provided in a selected surface portion of said single crystal layer other than said second region;

a second layer of insulating material provided on said single crystal layer and having window portions for providing electrode contacts therethrough; and

electrodes extending through the window portions of said second layer for making electrical contact with semiconductor material exposed therebeneath.

3,959,813

GENERATION OF A SWITCHING SIGNAL FOR THE CHROMA KEYING OF COLOR VIDEO SIGNALS

Ernst Legler, Seeheim, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Nov. 20, 1974, Ser. No. 525,476

Claims priority, application Germany, Dec. 8, 1973, 2361269

Int. Cl.² H04N *5/22*

U.S. Cl. 358—22 **9 Claims**

1. In an apparatus for generating a switching signal for chroma keying of color video signals, wherein the switching signal attains a maximum value when a video signal exhibits a preselected hue, the switching signal exceeding a preselected threshold value when said preselected hue attains a preselected saturation, comprising:

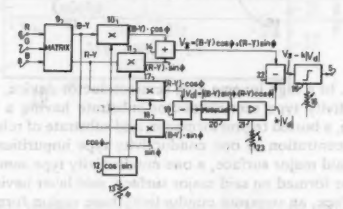
A. matrix means for receiving primary-color video signals,

B. first multiplier means responsive to the matrix means for deriving a first multiplied signal which is proportional to a first color difference, taken from the primary color video signals, multiplied by a cosine function of an angular variable value of the preselected hue in a color spectrum,

C. second multiplier means responsive to the matrix means for deriving a second multiplied signal which is proportional to a second color difference multiplied by a sine function of said angular variable value, and

D. adding means for adding the first and second multiplied signals together to form a first signal component,

the improvement for allowing the degree of hue selection to be set independently of the hue selected, comprising:



E. third multiplier means for generating a third multiplier signal proportional to said first color difference multiplied by said sine function,

F. fourth multiplier means for generating a fourth multiplied signal proportional to said second color difference multiplied by said cosine functions,

G. means for additively combining the third and fourth multiplied signals with opposite polarities to form thereby a second signal component,

H. means for selectively adjusting the absolute magnitude of the second signal component, and

I. means for subtracting from the first signal component the adjusted absolute magnitude of the second signal component to generate said switching signal, wherein the second signal component equals zero for the preselected hue and differs from zero for colors adjacent to the preselected hue.

3,959,814

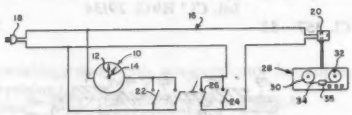
METHOD AND APPARATUS FOR TABULATING THE CONTENTS ON A RECORD MEDIUM BY USE OF TIME

David G. Howard, 137 Monticello Ave., Annapolis, Md. 21401

Filed July 31, 1974, Ser. No. 493,640

Int. Cl.² G11B *15/18, 27/02*

U.S. Cl. 360—13 **3 Claims**



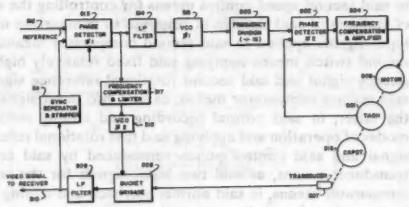
1. In combination with recording mechanism, apparatus enabling tabulation from said recording mechanism of a plurality of messages of varying length recorded in sequence on a record medium operated by said mechanism comprising an electrical circuit, means for selectively connecting said circuit to a source of electrical energy, an electrical time piece in said circuit constructed and arranged to indicate elapsed time in pre-determined units of time, first switch means in said circuit for selectively connecting said time piece through said circuit

to said source of energy when said circuit is connected thereto, means releasably connecting said recording mechanism to said electrical circuit in parallel with said time piece, second switch means in said circuit operable independently of said first switch means for selectively connecting said recording mechanism through said circuit to said source of energy when said circuit is connected thereto, and third switch means in said electrical circuit operable independently of said first and second switch means for selectively simultaneously connecting said time piece and said recording mechanisms to said source of energy when said circuit is connected thereto.

3,959,815
ARRANGEMENTS FOR TIME BASE ERROR COMPENSATION

Gerhard Rotter, Mission Viejo; William A. Buchan, Newport Beach, and Rainer an der Heiden, Anaheim, all of Calif., assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 28, 1974, Ser. No. 437,285
Int. Cl.² H04N *5/795*; G11B *15/54*
U.S. Cl. 360—36 **6 Claims**



1. A circuit arrangement for the correction of time base error in a video signal taken off a recording medium moved by a drive motor at variable speed, said video signal including both information components and time base pulses, said arrangement comprising:

a separator for separating the time base pulses from the information components in the video signal taken off said recording medium, to provide a first feedback signal;

generator means responsive to the rate of rotation of said motor for generating a second feedback signal; and

a source for generating a reference pulse signal;

wherein there are provided first and second comparison circuits;

said first comparison circuit being connected to compare said first feedback signal including said time base pulses with the reference pulse signal;

circuit connections impressing the output of said first comparison circuit as a reference signal on said second comparison circuit, said second comparison circuit being connected to compare the second feedback signal with the output of the first comparison circuit; and

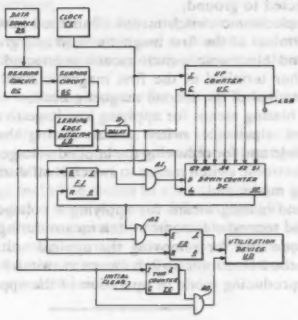
circuit means connected to the output of the second comparison circuit for altering the speed of rotation of said drive motor, thereby to vary the speed of said recording medium.

3,959,816
METHOD AND APPARATUS FOR INTERPRETING BINARY DATA

Camil P. Spiecens, 264 E. Broadway, New York, N.Y. 10002

Filed Feb. 24, 1975, Ser. No. 552,125
Int. Cl.² G11B *5/09*
U.S. Cl. 360—44 **10 Claims**

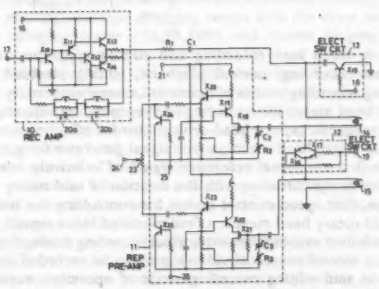
1. In a system serially transferring bits of data wherein the bits of data are represented by signals in bit cells defined by displaced first and second transitions of a signal amplitude in a first direction and wherein the type of bit within a cell is defined by the position within a bit cell of a third transition of the signal amplitude in a second and opposite direction between said first and second transitions such that a first type of bit is represented when said third transition is closer to said first transition than said second transition and a second type of bit is represented when said third transition is closer to said second transition than said first transition, the method of identifying which type of bit is represented by the signal occurring within a bit cell comprising the steps of measuring the entire duration of a bit cell preceding the bit cell whose bit type is to be identified, forming a predetermined fraction of time of such duration, and determining whether the time between the first and third transitions of the bit cell whose type is to be identified is greater or less than the formed predetermined fraction of the time of the entire duration of said preceding bit cell.



3,959,817
SWITCHING CIRCUIT FOR CONNECTING A MAGNETIC HEAD IN A MAGNETIC RECORDING AND REPRODUCING APPARATUS

Yoshihiko Honjō, Kozagun, and Seisuke Hiraguri, Yokohama, both of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Oct. 29, 1974, Ser. No. 518,769
Claims priority, application Japan, Nov. 15, 1973, 48-131218[U]; Nov. 16, 1973, 48-128429
Int. Cl.² G11B *15/12*
U.S. Cl. 360—62 **5 Claims**



1. A magnetic head switching circuit for use in a magnetic recording and reproducing apparatus having at least first and second two terminal magnetic heads for recording signals on and reproducing signals from a magnetic recording medium and having recording and reproducing modes of operation, said magnetic head switching circuit comprising:

recording amplifier means having an output side connected to one of two terminals of the first magnetic head;

a two input reproducing amplifier means having one input connected to the other terminal of the first magnetic head and having the other input connected to one terminal of the second magnetic head for amplifying signals reproduced by the first and second magnetic heads respectively;

the other terminal of the second magnetic head being connected to ground;

first electronic switch means connected between said one terminal of the first magnetic head and ground;

second electronic switch means connected between said other terminal of the first magnetic head and said one terminal of the second magnetic head;

first biasing means for applying a voltage to switch on said first electronic switch means during the reproducing mode and for removing the applied voltage from said first electronic switch means to switch it off during the recording mode; and

second biasing means for applying a voltage to switch on said second electronic switch means during the recording mode and for removing the applied voltage from said second electronic switch means to switch it off during the reproducing mode of operation of the apparatus.

3,959,818

SERVO FOR VIDEO TAPE APPARATUS WITH EDITING CAPABILITIES

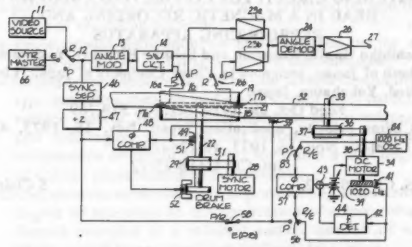
Kazuo Iketaki, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 401,448, Sept. 27, 1973, abandoned. This application Mar. 26, 1975, Ser. No. 562,047

Claims priority, application Japan, Sept. 28, 1972, 47-112646[U]

Int. Cl.² G11B *19/28, 27/02*

U.S. Cl. 360—70 **5 Claims**



1. A video tape recording and editing apparatus having normal recording, normal playback, editing playback and editing recording modes of operation, comprising rotary magnetic head means for recording and reproducing video signals on a magnetic tape, a head drive motor for effecting rotation of said rotary head means, a first signal generator for generating a first rotational reference signal of relatively low frequency in synchronism with the rotation of said rotary head means, first speed control means for controlling the rotation of said rotary head means, a first source of video signals to be recorded on said tape in said normal recording mode of operation, a second source of video signals to be recorded on said tape in said editing recording mode of operation, separator means for separating control pulses from video signals supplied thereto, first switch means for supplying signals to said separator means from said first source in said normal recording mode of operation and from said second source in both said editing playback and editing recording modes of operation and for isolating said separator means from said first and second sources in said normal playback mode of operation, control transducer means for recording said control pulses from said separator means on said tape in said normal and editing recording modes of operation and for reproducing said control pulses recorded on the tape in said normal and editing playback modes of operation, first comparator means connected with said first speed control means for controlling the rotation of said rotary head means in response to comparison of two input signals applied to said first comparator means, means applying said first rotational reference signal and said control pulses from said separator means as said two input signals for the first comparator means in said normal recording, editing playback and editing recording modes of operation, and applying said first rotational reference signal and the reproduced control pulses from said control transducer means as said two input signals for the first comparator means in said normal playback mode of operation, a rotatable capstan for effecting longitudinal movement of the tape in each of said modes of operation, a capstan drive motor for rotating said capstan, a second signal generator for generating a second rotational reference signal of relatively high frequency in synchronism with the rotation of said capstan, second speed control means for controlling the speed at which said capstan drive motor rotates said capstan, a source of a fixed relatively high frequency signal of the same order as said second rotational reference signal, second comparator means connected to said second speed control means for controlling the speed of rotation of said capstan in response to comparison of two input signals applied to said second comparator means, and second switch means applying said fixed relatively high frequency signal and said second rotational reference signal to said second comparator means, as said two input signals for the latter, in said normal recording and editing recording modes of operation and applying said first rotational reference signal and said control pulses reproduced by said control transducer means, as said two input signals for the second comparator means, in said normal playback and editing playback modes of operation.

3,959,819

SERVO SYSTEM FOR VIDEO SIGNAL RECORDING AND PLAYBACK SYSTEM

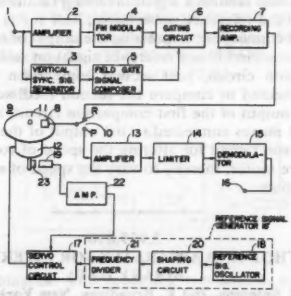
Morihiro Kubo, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Feb. 20, 1974, Ser. No. 444,136

Claims priority, application Japan, Mar. 13, 1973, 48-29282; Feb. 20, 1973, 48-20469

Int. Cl.² H04N *5/795*; G11B *17/00, 19/24*

U.S. Cl. 360—73 **7 Claims**



1. A servo system for use in a video signal recording and playback apparatus, for controlling the speed of rotation of an electric motor which drives a recording medium in repeating cycles of rotation and in which one field of the composite video signal is recorded on a predetermined track of the recording medium, in each such cycle, which comprises:

signal generating means for generating a reference signal having a period equal to an integral multiple of the horizontal synchronizing period of the composite video signal, said reference signal period being substantially equal to the period of one field of the composite video signal,

means responsive to each complete rotation of the electric motor for generating a rotational signal indicative of the speed of rotation thereof, and

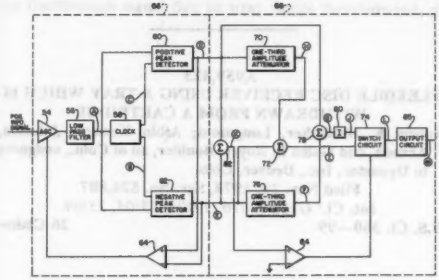
a servo control circuit which controls the speed of rotation of the electric motor in response to a phase difference between the reference signal and the rotational signal indicative of the rotational speed of the electric motor.

3,959,820

SYSTEM FOR INCREASING THE NUMBER OF DATA TRACKS IN A MAGNETIC RECORDING SYSTEM

William A. Braun, Acton, Mass., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Sept. 16, 1974, Ser. No. 506,492
Int. Cl.² G11B *21/10*
U.S. Cl. 360—77 **31 Claims**



1. In a magnetic storage device wherein a transducer is positioned over a storage surface in response to the sensing of previously recorded information contained within separately identifiable position information tracks, said separately identifiable position information tracks alternately containing information of a first type followed by information of a second type, apparatus for defining the position of the transducer relative to the storage surface, said apparatus comprising:

means for generating two separate periodic signals in response to said transducer traversing the position information tracks, each of said separate periodic signals having the same frequency and representing the signal strength of one of the two types of information being sensed by said transducer; and

means for combining said periodic signals into a third signal having a periodic frequency equal to twice that of the periodic frequency of said two separate periodic signals.

3,959,821

SOUND RECORDING AND/OR REPRODUCING APPARATUS WITH MOVABLE CARRIAGE RECEIVING REMOVABLE TAPE CASSETTE

Righi Nardino, Milan, Italy, assignor to Elpro S.A., Mauren, Liechtenstein

Filed Aug. 6, 1974, Ser. No. 495,249
Int. Cl.² G11B *15/18*, *5/54*, *21/22*
U.S. Cl. 360—96 **21 Claims**

1. Apparatus for sound recording and/or reproducing on magnetic tape contained in a cassette having two bobbins around which the magnetic tape is wound, comprising:

a movable carriage (C) for receiving a tape cassette;

a supporting frame (A) having guide means only allowing movement of said carriage linearly and horizontally between a loading position and an operative position to locate a cassette in said apparatus, such that the longitudinal axis of the active length of the magnetic tape in a cassette in the carriage is moved parallel to the direction of displacement of the carriage along said guide means;

a vertically movable supporting plate (C1) beneath said carriage;

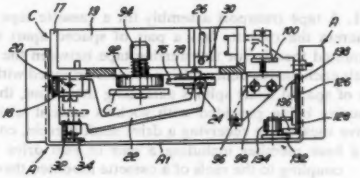
guiding means (**22,23** and **31,33**) retaining said supporting plate and only allowing movement of said supporting plate substantially in the vertical direction between inoperative and operative positions while always maintaining said supporting plate substantially parallel to the bottom of said carriage;

tape dragging means (**75,94**) coupled to said supporting plate for engaging a bobbin of a received cassette when said carriage and said supporting plate are in their operative positions;

drive means including a motor for driving the other of said bobbins of a received cassette;

recording and/or reproducing means including at least one recording and/or reproducing head for engaging the tape in a received cassette;

said carriage including means to actuate said tape dragging means and said drive means, and for bringing the at least one head into engagement with said magnetic tape, responsive to said carriage being moved to its operative position in said frame whereby said casssette is operatively received therein;



commutable clutch means (**74,78-92**) for operatively connecting said tape dragging means with the drive motor;

a swinging frame (**96,98,100**) and means hinging said swinging frame to said carriage (C) about a swinging axis substantially parallel with the direction of displacement of said carriage and therefore with the longitudinal axis of the active length of the tape contained in a received cassette, said swinging frame supporting at least said at least one head, said hinging means providing pivotal movement of said swinging frame between an operative position in which said at least one heat engages the tape of a received cassette and an inoperative position spaced from a received cassette;

spring latch means (**40,42**) provided between said carriage (C) and said supporting frame (A), to retain said carriage in its operative position or inoperative position; and

two driving means, the first of which (**32, 34**) is coupled to selectively lift and lower said supporting plate and the second of which **114,116**) is coupled to cause said swinging frame to swing about its swinging axis, both driving means acting responsive to the displacement of the carriage along said guide means whereby when said carriage is in its operative position said support plate and said swinging frame are in their operative positions.

3,959,822

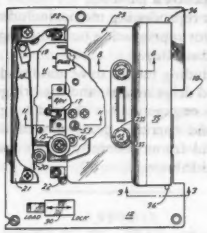
MAGNETIC TAPE TRANSPORT FOR POSITIVE COUPLING OF CASSETTE TAPE REELS

John D. Platt, South Laguna, Calif., assignor to MSI Data Corporation, Costa Mesa, Calif.

Continuation of Ser. No. 356,374, May 2, 1973, abandoned, which is a division of Ser. No. 104,351, Jan. 6, 1971, Pat. No. 3,751,042. This application Feb. 14, 1975, Ser. No. 550,005

Int. Cl.² G11B 21/00, 15/24, 15/32; B65H 17/02

U.S. Cl. 360—96 2 Claims



1. A tape transport assembly for a cassette tape cartridge wherein the cassette has a pair of spaced apart tape reels mounted therein for transferring tape between the reels, the reels each having central drive sockets provided with a plurality of spaced apart splines extending therefrom, the cassette housing being provided with sockets coaxial with the reel drive sockets for receiving a drive shaft therein, comprising

a base member including a pair of reel drive shafts for coupling to the reels of a cassette mounted thereon, each of the drive shafts having planar outer surfaces to receive the splines of the reels in a positive coupling relationship for rotating same upon properly placing the cassette thereon, each of the drive shafts being constructed and defined to cause the drive shaft to be axially movable to a collapsed position in response to the placement of the cassette thereon and axially movable in the opposite direction to cause the planar surfaces to engage the reel splines in response to the rotation of the drive shafts in the event the cassette is improperly oriented on the drive shaft relative to the longitudinal axis thereof whereby positive coupling of the splines of the tape reels to the planar surfaces of the drive shafts is assured,

means mounted on the base member for releasably mounting a cassette tape cartridge having a pair of rotatable reels with tape extending between the reels and coupled to said reel drive shafts,

a rotatable capstan mounted on the base member and extending therefrom so as to engage one side of the tape,

means coupled to the capstan for rotatably driving same mounted on the opposite side of the base from the cassette mounting means,

a head plate mounted on one side of the base member adjacent to the capstan and to allow movement toward and away from the capstan, said head plate mounting at least a single transducer and a pinch roller in spaced apart relationship to allow the pinch roller to rotatably engage the capstan with the tape therebetween,

a radius arm pivotably mounted to the opposite side of the base member from the head plate and pivotably mounting the head plate, the head plate being pivotable with respect to the radius arm and movable therewith to allow the tape to be advanced from one reel to the other when the plate is swung towards the capstan and allowing the transducer to be operative on the advancing tape,

means mounted on the base member for resiliently positioning the head plate relative to the base member and for urging it towards the cassette mounting means, and

control means mounted on the base member for moving the head plate toward the cassette to operatively position the transducer and pinch roller with respect to the tape and capstan, respectively, to allow a transducing operation on the tape; and for moving the head plate away from the pinch roller to allow the mounting and demounting of the tape cartridge on the base member;

said control means including automatic means for moving the radius arm to pivot the transducer and pinch roller on the head plate away from the tape and capstan respectively to a spaced position sufficient to allow the tape of the tape cartridge to be transferred from one reel to the other reel of the tape cartridge.

3,959,823

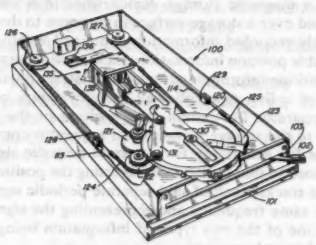
FLEXIBLE DISC RECEIVER USING A TRAY WHICH IS WITHDRAWN FROM A CARTRIDGE

Robert F. Heidecker, Longmont; Albin Kenneth Johnson, Arvada, and Galen B. Royer, Boulder, all of Colo., assignors to Dynastor, Inc., Denver, Colo.

Filed Nov. 18, 1974, Ser. No. 524,807

Int. Cl.² G11B 5/016, 17/04, 23/04, 25/04

U.S. Cl. 360—99 26 Claims



1. Apparatus for cooperating with a disc cartridge wherein said cartridge includes an exterior envelope housing and a tray which is received within the housing and retained therein by a releasable latching means with engaging means on one edge of the tray which edge completes the cartridge exterior in conjunction with the envelope housing, the tray being arranged for holding the disc via a hub nested in a port in the tray, said apparatus comprising:

a frame having means for receiving the cartridge,

means for releasing the latching means of the cartridge and for retaining the cartridge housing relative to said frame,

means for withdrawing the tray from the cartridge housing including means for attaching to the tray engaging means when the cartridge is received by said frame receiving means,

means for displacing the disc hub from the tray, and

means for imparting rotary motion to the displaced disc hub so that the disc rotates free of the tray and said frame.

3,959,824

TWO GAP READ/WRITE HEAD ASSEMBLY

Nobuaki Ohi; Kanzi Ito; Katsuo Kamata, and Masaru Sato, all of Yokohama, Japan, assignors to Tohoku Metal Industries Limited, Japan

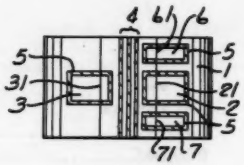
Division of Ser. No. 203,391, Nov. 30, 1971. This application Jan. 25, 1974, Ser. No. 436,598

Claims priority, application Japan, Nov. 30, 1970, 45-104856; Nov. 20, 1971, 46-92741

Int. Cl.[2] G11B *5/20*

U.S. Cl. 360—124 **13 Claims**

1. In a two gap read/write head assembly used for magnetic recording which comprises a housing, a write pole-piece contained in said housing, a read pole-piece contained in said housing and placed very close to said write pole-piece followingly to said write pole-piece in the direction of motion of a magnetic recording medium, respective gaps of said write pole-piece and said read pole-piece being exposed out of said housing so that said gaps may be engaged with said magnetic recording medium, a write coil wound to said write pole-piece, and a read coil wound to said read pole-piece, magnetic shield means interposed between said pole-pieces to assist in reducing feedthrough signal due to stray fluxes therebetween, an improvement comprising a pair of auxiliary pole-pieces placed at both sides of said read pole-piece so that said read pole-piece is placed between said auxiliary pole-pieces, respective gaps of said pair of auxiliary pole-pieces being aligned to the



gap of said read pole-piece, and auxiliary coils wound to said respective auxiliary pole-pieces reversely to said read coil in the winding direction, said auxiliary coils and said read coil being connected in series.

DESIGN PATENTS

GRANTED MAY 25, 1976

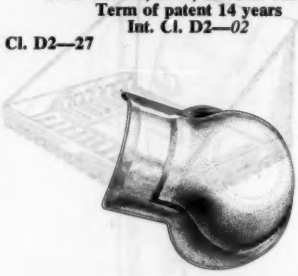
ERRATA

For CLASS	See PATENT NO.
004–024	239,987
025–004	240,030
025–022	240,031
019–049	240,032
016–065	240,077
016–070	240,078
016–065	240,079
016–027	240,080

DESIGNS

MAY 25, 1976

239,982
PROTECTIVE SHOULDER CAP
Leif H. Skottheim, Malung, Sweden, assignor to Jofa AB, Malung, Sweden
Filed Oct. 10, 1974, Ser. No. 513,850
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—27



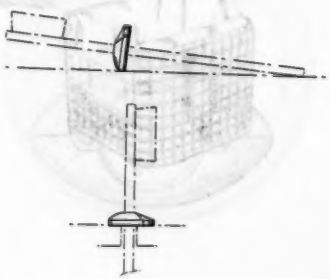
239,983
SPORTS SHOE
Jonas Senter, Greenwich, Conn., assignor to CITC Industries, New York, N.Y.
Filed Sept. 11, 1974, Ser. No. 505,200
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310

239,984
NECK PIECE
Maria K. Hohn, 20980 Morewood Parkway, Rocky River, Ohio 44116
Filed Jan. 28, 1974, Ser. No. 437,323
Term of patent 14 years
Int. Cl. D2—*05*
U.S. Cl. D2—347

239,985
BELT-ATTACHABLE CARRYING CASE
Kenneth W. Artz, Albuquerque, N. Mex., assignor to Koszegi Leather & Vinyl Products, Inc., South Bend, Ind.
Filed Dec. 11, 1974, Ser. No. 531,487
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400

239,986
BELT-ATTACHABLE CARRYING CASE
Kenneth W. Artz, Albuquerque, N. Mex., assignor to Koszegi Leather & Vinyl Products, Inc., South Bend, Ind.
Filed Dec. 11, 1974, Ser. No. 531,488
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400

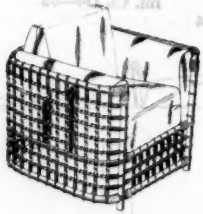
239,987
TOOTHBRUSH GUARD AND SUPPORT
George T. Gallo, 15 Cataldo Drive, Revere, Mass. 02151
Filed Mar. 27, 1975, Ser. No. 562,429
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—24



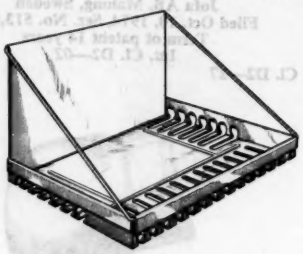
239,988
CHAIR OR SIMILAR ARTICLE
Karl Dittert, Schwabisch Gmund, Germany, assignor to Giroflex-Entwicklungs-AG, Koblenz, Switzerland
Filed June 18, 1973, Ser. No. 371,294
Claims priority, application Switzerland Feb. 23, 1973
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

239,989
COMBINED MOTORCYCLE SEAT AND BACKREST
Marion L. Green and Sandra E. Green, both of Rte. 3, Mount Vernon, Ill. 62864
Filed Apr. 24, 1975, Ser. No. 571,210
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D6—48.1

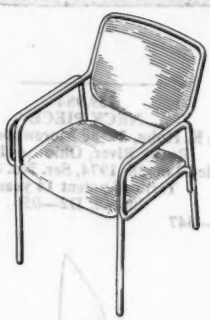
239,990
ARM CHAIR
Henry Olko, Applegreen Drive, Old Westbury, N.Y. 11568
Filed Aug. 20, 1974, Ser. No. 499,018
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57



239,991
DISPLAY STAND FOR HOSING OR THE LIKE
Donald M. Hanson, Mount Prospect, Ill., assignor to O.E.M. Products Co., Des Plaines, Ill.
Filed July 24, 1974, Ser. No. 491,536
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—85

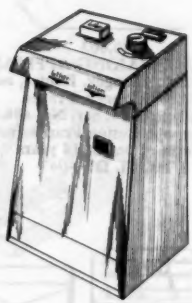


239,992
ARMCHAIR OR SIMILAR ARTICLE
Gregory S. Gabourie, 30 Hills Road, Ajax L1S 2W4, Ontario, Canada
Filed Mar. 19, 1975, Ser. No. 559,804
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—78

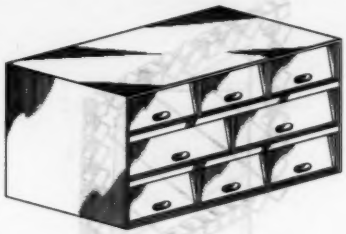


239,993
MERCHANDISE DISPLAY STAND
William S. Leath, 1904 Highfield Drive, Birmingham, Ala. 35216
Filed Apr. 11, 1974, Ser. No. 459,894
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—85

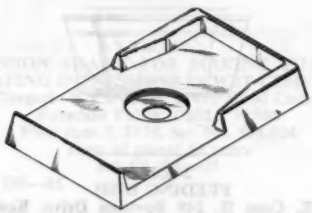
239,994
ELECTRIC SHAVE CREAM DISPENSER OR SIMILAR ARTICLE
George H. Fitzsimonds, Bridgeport, Conn., assignor to General Electric Company
Filed Mar. 31, 1975, Ser. No. 563,670
Term of patent 7 years
Int. Cl. D9—*01*
U.S. Cl. D6—95



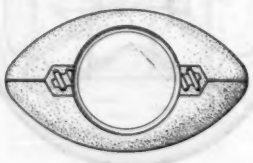
239,995
STORAGE UNIT
John E. Sgombick, Ramsey, N.J., assignor to Xerox Corporation, Stamford, Conn.
Filed May 31, 1974, Ser. No. 475,011
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—166



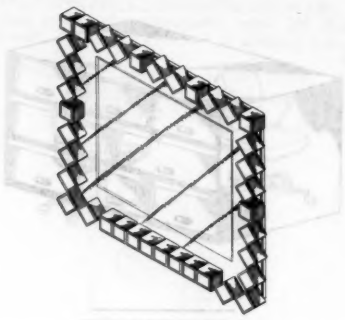
239,996
ROTATABLE SUPPORT BASE FOR A TELEVISION VIEWER OR SIMILAR ARTICLE
Herbert J. Hampel, Philadelphia, Pa., and William A. Hoffman, Collingswood, N.J., assignors to Ultronic Systems Corporation, Moorestown, N.J.
Filed Mar. 24, 1975, Ser. No. 561,637
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—194



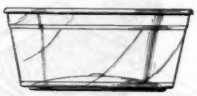
239,997
PHOTO FRAME
Ralph R. Burin, Glen Ellyn, and Harold Stelicha, Wilmette, Ill., assignors to Intercraft Industries Corporation
Filed Sept. 9, 1974, Ser. No. 504,554
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—236



239,998
PICTURE FRAME
William Burton Barber, Sr., 2911 Monroe Place, Falls Church, Va. 22042
Filed Mar. 21, 1974, Ser. No. 453,540
Term of patent 7 years
Int. Cl. D6—*07*
U.S. Cl. D6—242

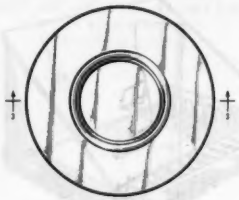


239,999
DISH
Hubert E. Christian, Phoenix, Ariz., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Dec. 27, 1974, Ser. No. 537,012
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—23



240,000
FEEDING DISH
Richard E. Cone II, 249 Bowman Drive, Kent, Ohio 44240, and Robert A. Hasenstab, 1678 Groton Drive, Hudson, Ohio 44236
Filed Jan. 20, 1975, Ser. No. 542,507
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—24

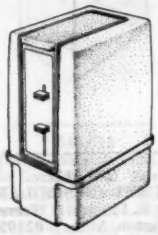
240,001
SERVING TRAY
Austin F. Myers, 204 Sycamore Lane 17402, and William S. Ripley, 1171 Fairview Drive 17403, both of York, Pa.
Filed Sept. 18, 1973, Ser. No. 398,477
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—27



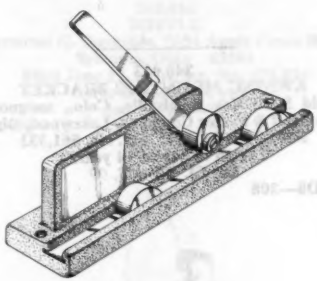
240,002
PLATE OR THE LIKE
Ottorino N. Mercadante, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed July 15, 1974, Ser. No. 488,225
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—36

240,003
YOGHURT MAKING APPLIANCE
Jacques Gairard, Selongey, France, assignor to SEB, Selongey, France
Filed July 5, 1974, Ser. No. 486,198
Claims priority, application France Jan. 22, 1974
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—96

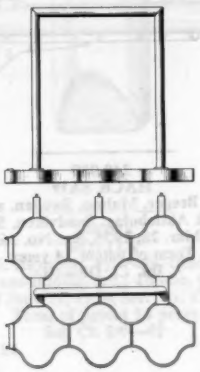
240,004
ICE CRUSHER
Hiroshi Toyota, Osaka-shi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Japan
Filed Dec. 12, 1974, Ser. No. 532,102
Term of patent 14 years
Int. Cl. D7—*04;* D15—*07*
U.S. Cl. D7—156



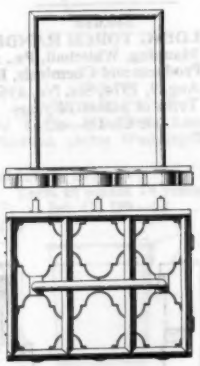
240,005
BENDER OR STRAIGHTENER
Donald R. Humphreys, Topsfield, Mass., assignor to Custom Radius Corporation, Topsfield, Mass.
Filed Oct. 15, 1974, Ser. No. 514,410
Term of patent 7 years
Int. Cl. D8—*05*
U.S. Cl. D8—32



240,006
IMPRESSION FRAME FOR MAKING TILE-SIMULATING IMPRESSIONS IN WET CEMENT
Gregorio B. Cardenas, 17412 Hood Court, Fountain Valley, Calif. 92708
Filed June 5, 1975, Ser. No. 584,023
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—45

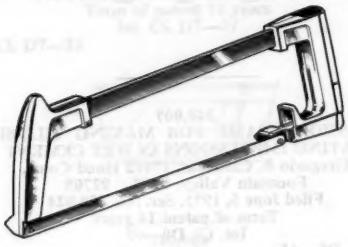


240,007
IMPRESSION FRAME FOR MAKING TILE-SIMULATING IMPRESSIONS IN WET CEMENT
Gregorio B. Cardenas, 17412 Hood Court, Fountain Valley, Calif. 92708
Filed June 5, 1975, Ser. No. 584,024
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—45

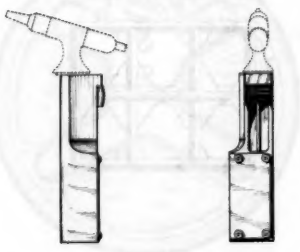


240,008
MINIATURE VACUUM CLEANING TOOL OR THE LIKE
William S. Fortune, 14250 Dearborn St., Panorama City, Calif. 91402
Filed June 24, 1974, Ser. No. 482,222
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51

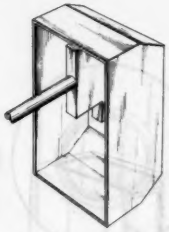
240,009
HACK SAW
Carl-Arne Breger, Malmo, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden
Filed Mar. 28, 1975, Ser. No. 562,924
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—96



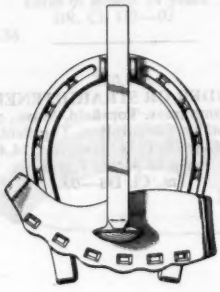
240,010
WELDING TORCH HANDLE
Richard W. Manning, Whitehall, Pa., assignor to Air Products and Chemicals, Inc.
Filed Aug. 9, 1974, Ser. No. 496,051
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—107



240,011
LATCH FOR ROLLING METAL GATES
Vincent Greco, 195 Huntington Ave., Bronx, N.Y. 10465
Filed Feb. 1, 1974, Ser. No. 439,071
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—127



240,012
DOOR KNOCKER OR SIMILAR ARTICLE
Theodore R. Lingley, 3 Warren Lane, Weston, Mass. 02193
Filed Mar. 17, 1975, Ser. No. 558,638
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—178



240,013
AWNING MOUNTING BRACKET
Donald S. McKee, Louisville, Colo., assignor to The Scott & Fetzer Company, Lakewood, Ohio
Filed Mar. 24, 1975, Ser. No. 561,333
Term of patent 14 years
Int. Cl. D8—*08, 09*
U.S. Cl. D8—208

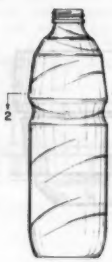
240,014
AWNING MOUNTING BRACKET
Donald S. McKee, Louisville, Colo., assignor to The Scott & Fetzer Company, Lakewood, Ohio
Filed Mar. 24, 1975, Ser. No. 561,301
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—233

240,015
PAINTING MOUNTING CLIP
Babe Buckley, P.O. Box 212, Lake City, Colo. 81235
Filed Nov. 11, 1974, Ser. No. 522,356
Term of patent 7 years
Int. Cl. D8—*08*
U.S. Cl. D8—258

240,016
BOTTLE
Raymond G. Reynolds, 7034 Apple Creek Road, Sylvania, Ohio 43560
Filed June 17, 1974, Ser. No. 479,815
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—10

240,017
BOTTLE
David H. Trott, Cincinnati, Ohio, assignor to Crossbow, Inc., Cincinnati, Ohio
Filed July 11, 1974, Ser. No. 487,565
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—59

240,018
BOTTLE
Raymond G. Reynolds, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed June 17, 1974, Ser. No. 479,777
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—119



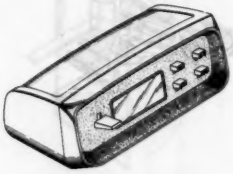
240,019
NESTABLE CUP
Harold Edward Taylor, Garforth, Leeds, England, assignor to Plastona (John Waddington), Ltd., Leeds, England
Filed Jan. 6, 1975, Ser. No. 538,929
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—220

240,020
CONTAINER END PANEL
Fred C. Newman, La Grange Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Oct. 11, 1974, Ser. No. 514,044
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—253

240,021
STOPPER OR THE LIKE
Creighton M. Lawhead, Corning, N.Y., assignor to Corning Glass Works
Filed Dec. 16, 1974, Ser. No. 532,827
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—285

240,022
CLOSURE PLUG
Jeremiah J. Laurizio, Providence, N.J. (% American Flange & Mfg. Co. Inc., 30 Rockefeller Plaza, New York, N.Y. 10020)
Filed Nov. 11, 1974, Ser. No. 522,695
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—288

240,023
DIGITAL CLOCK
Ellworth R. Danz, La Salle, and John C. Crenshaw, Joliet, Ill., assignors to General Time Corporation, Thomaston, Conn.
Filed Aug. 14, 1974, Ser. No. 497,452
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



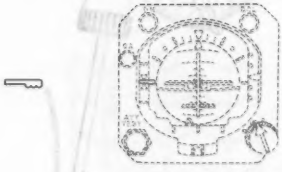
240,024
LIQUID CRYSTAL CONVERTER THERMOMETER
Neil R. Riley, Livermore, Calif., assignor to Thermoptics, Inc., Livermore, Calif.
Filed Oct. 4, 1974, Ser. No. 512,215
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57

240,025
BUOY
Robert F. Curd, Jr., Fort Marshall, Sullivans Island, S.C. 29482
Filed Nov. 7, 1974, Ser. No. 521,777
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—107

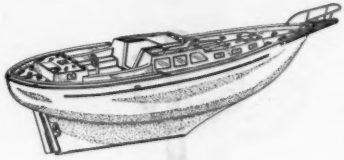
240,026
CLOCK DIAL
Roman J. Szalek, La Salle, Ill., assignor to General Time Corporation, Thomaston, Conn.
Filed Dec. 20, 1974, Ser. No. 535,145
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—126

240,027
CLOCK DIAL
Roman J. Szalek, La Salle, Ill., assignor to General Time Corporation, Thomaston, Conn.
Filed Dec. 19, 1974, Ser. No. 534,645
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—126

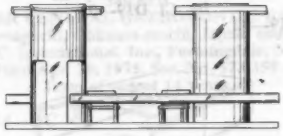
240,028
INDICATOR POINTER FOR FLIGHT INSTRUMENT
John Peter Dietrich, Glendale, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Mar. 27, 1974, Ser. No. 455,483
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—127



240,029
BOAT
William I. B. Crealock, 1401 Forest Ave., Carlsbad, Calif. 92008
Filed Sept. 5, 1974, Ser. No. 503,505
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—64



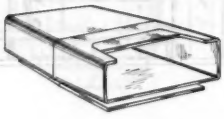
240,030
STATION FOR ELEVATED RAILWAY
Lawrence K. Edwards, 565 Arastradero Road, Palo Alto, Cal[if]. 94306
Filed Oct. 2, 1973, Ser. No. 402,842
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—4

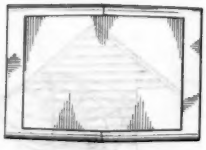


240,031
RESTAURANT BUILDING
Kenneth T. Kerrigan, 400 NE. 5th Ave., Pompano Beach, Fla. 33060
Filed Sept. 12, 1974, Ser. No. 505,504
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22

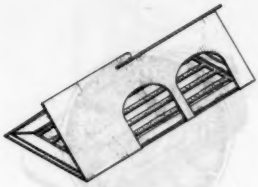
240,032
WRITING INSTRUMENT OF THE MARKING TYPE
Francine Gomez, Paris, France, assignor to Waterman S.A., Paris, France
Filed June 19, 1974, Ser. No. 480,629
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—49

240,033
MEMO BOX
William Macowski, Caldwell, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed Mar. 6, 1975, Ser. No. 555,978
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—92



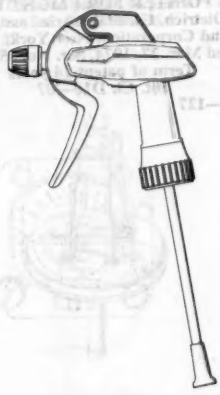


240,034
TRAP FOR CRAWLING INSECTS
Kozaburo Takimoto, 18492 Durfee Lane, Villa Park, Calif. 92667
Filed Oct. 21, 1974, Ser. No. 516,435
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—19

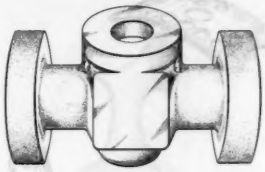


240,035
MULTI-PURPOSE KNIFE
George J. Ruth, 6934 Calhoun St., Dearborn, Mich. 48126
Filed July 26, 1974, Ser. No. 492,285
Term of patent 14 years
Int. Cl. D7—*03*; D8—*03*
U.S. Cl. D22—31

240,036
SPRAYER
Tetsuya Tada, 1339 Nishi Takadomari, Onoda, Yamaguchi-ken, Japan
Filed July 5, 1974, Ser. No. 486,000
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—17



240,037
GATE VALVE BODY
Willard E. Kemp, Houston, and Wayne B. Palmer, Richmond, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.
Filed Jan. 23, 1975, Ser. No. 543,205
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

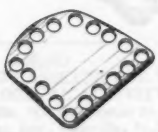


240,038
COMBINED TOILET SEAT AND COVER
Luigi Colani, Sassenberg, Germany, assignor to Dansk Pressalit A/S, Aarhus, Denmark
Filed Jan. 10, 1975, Ser. No. 540,201
Claims priority, application Denmark Dec. 18, 1974
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71

240,039
CUSPID ORTHODONTIC BASE
Kozo Kawaguchi, Ohkuma-machi, Japan, assignor to G.A.C. International, Inc., Farmingdale, N.Y.
Filed Apr. 30, 1975, Ser. No. 573,308
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—1 C

240,040
BICUSPID ORTHODONTIC BASE
Kozo Kawaguchi, Ohkuma-machi, Japan, assignor to G.A.C. International, Inc., Farmingdale, N.Y.
Filed Apr. 30, 1975, Ser. No. 573,358
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—1 C

240,041
UPPER CENTRAL ORTHODONTIC BASE
Kozo Kawaguchi, Ohkuma-machi, Japan, assignor to G.A.C. International, Inc., Farmingdale, N.Y.
Filed Apr. 30, 1975, Ser. No. 573,359
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—1 C



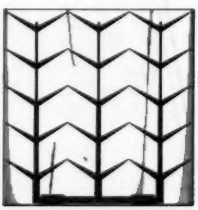
240,042
LOWER ANTERIOR ORTHODONTIC BASE
Kozo Kawaguchi, Ohkuma-machi, Japan, assignor to G.A.C. International, Inc., Farmingdale, N.Y.
Filed Apr. 30, 1975, Ser. No. 573,360
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—1 C

240,043
MOLAR ORTHODONTIC BASE
Kozo Kawaguchi, Ohkuma-machi, Japan, assignor to G.A.C. International, Inc., Farmingdale, N.Y.
Filed July 30, 1975, Ser. No. 600,356
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—1 C

240,044
MOLAR ORTHODONTIC BASE
Kozo Kawaguchi, Ohkuma-machi, Japan, assignor to G.A.C. International, Inc., Farmingdale, N.Y.
Filed Apr. 30, 1975, Ser. No. 573,379
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—1 C

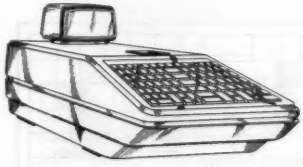
240,045
UPPER LATERAL ORTHODONTIC BASE
Kozo Kawaguchi, Ohkuma-machi, Japan, assignor to G.A.C. International, Inc., Farmingdale, N.Y.
Filed Apr. 30, 1975, Ser. No. 573,381
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—1 C

240,046
SOLAR CELL OR SIMILAR ARTICLE
Joseph Lindmayer, Bethesda, Md., assignor to Solarex Corporation, Rockville, Md.
Filed Oct. 23, 1973, Ser. No. 409,008
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—1 R



240,047
MICROPHONE TRANSDUCER HOUSING
Jerry O'Brien, 33 Pamrapo Ave., Jersey City, N.J. 07305
Filed Mar. 25, 1974, Ser. No. 454,223
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 J

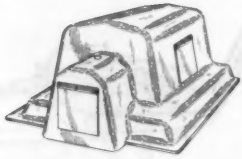
240,048
ELECTRONIC MACHINE FOR USE IN DOCUMENT PROCESSING
Robert L. Greene, Diamond Bar, and Lorin P. Olson, Tustin, Calif., assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio
Filed Aug. 1, 1974, Ser. No. 493,543
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



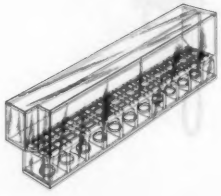
240,049
PIPE REST
Arthur A. Villarreal, 3568 Shurtleff Court, Los Angeles, Calif. 90065
Continuation-in-part of abandoned des'gn application Ser. No. 394,743, Sept. 6, 1973. This application Feb. 27, 1975, Ser. No. 553,571
Term of patent 14 years
Int. Cl. D27—*99*
U.S. Cl. D27—6

240,050
CIGARETTE LIGHTER
Alain Carre, Paris, France, assignor to Waterman S.A., Paris, France
Filed July 17, 1974, Ser. No. 489,267
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—39

240,051
FARROWING HOUSE
Mary K. Mayfield, 6707 W. 80th St., Overland Park, Kans. 66204
Filed June 28, 1974, Ser. No. 484,655
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1

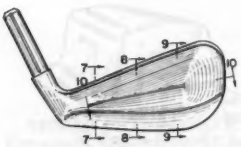


240,052
FLUID-CONTAINING CASSETTE FOR DETERMINING BIOLOGICAL ACTIVITY
John M. Varga, Bayville, N.Y., assignor to Akro-Medic Engineering, Inc., Denville, N.J.
Filed Feb. 6, 1975, Ser. No. 547,456
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D32—2 C



240,053
GAME CHIP
Joseph H. Garaventa, Reno, Nev., assignor to Harrah's Club, Reno, Nev.
Original design application Mar. 20, 1972, Ser. No. 236,540. Divided and this application Feb. 19, 1974, Ser. No. 429,040
Term of patent 14 years
Int. Cl. D12—*01*
U.S. Cl. D34—5 GP

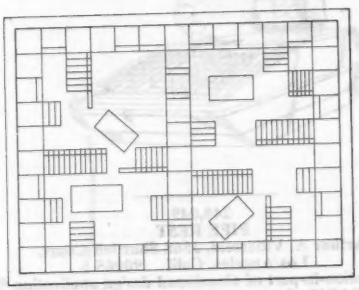
240,054
GOLF CLUB HEAD
Ivan M. Meissler, Providence, R.I. (18 Olympic Village, Apt. 1/C, Chicago Heights, Ill. 60411)
Filed Mar. 25, 1974, Ser. No. 454,673
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



240,055
GAME PADDLE
Lindsey G. Spivey II, Dallas, Tex., assignor to The Texas Group Incorporated, Dallas, Tex.
Filed Apr. 29, 1974, Ser. No. 464,968
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SP

240,056
PLAYGROUND APPARATUS AND SUPPORT FOR SWINGS OR THE LIKE
Donald D. Hock, Herrin, Ill., assignor to Turco Manufacturing Co., Du Quoin, Ill.
Filed Aug. 14, 1974, Ser. No. 497,454
Term of patent 3½ years
Int. Cl. D21—*03*
U.S. Cl. D34—5 M

240,057
GAME BOARD
Frank D. Homsey, 42 S. Hartford Ave., Youngstown, Ohio 44509
Filed Sept. 18, 1974, Ser. No. 507,244
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS

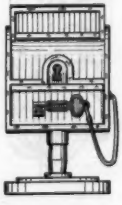


240,058
GOLF CLUB HEAD
Dan D. Bizovi, 8171 New Bradford Drive, Sterling Heights, Mich. 48077
Filed Oct. 24, 1974, Ser. No. 517,478
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

240,059
GAME BALL HOLDER
David J. Lewis, Jr., 29 Hudson Ave., Waldwick, N.J. 07463
Filed Nov. 25, 1974, Ser. No. 526,757
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB

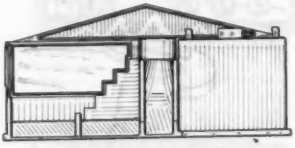
240,060
HEAD FOR A GOLF PUTTER
Tony J. Vella, 3504 Wesleyan Ave., Rockford, Ill. 61108
Continuation-in-part of design application Ser. No. 403,847, Oct. 5, 1973, now Patent No. 235,465. This application Jan. 16, 1975, Ser. No. 541,603
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

240,061
TOY MAIL BOX
Michael I. Satten, 245—20 Grand Central Parkway, Bellerose, N.Y. 11426
Filed Jan. 23, 1975, Ser. No. 543,481
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R



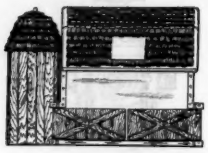
240,062
TOY FIRE HYDRANT
Michael I. Satten, 245—20 Grand Central Parkway, Bellerose, N.Y. 11426
Filed Jan. 23, 1975, Ser. No. 543,482
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R

240,063
TOY FIREHOUSE
Michael I. Satten, 245—20 Grand Central Parkway, Bellerose, N.Y. 11426
Filed Jan. 23, 1975, Ser. No. 543,484
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL



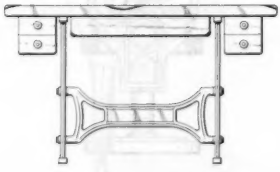
240,064
TOY PARKING METER
Michael I. Satten, 245—20 Grand Central Parkway, Bellerose, N.Y. 11426
Filed Jan. 23, 1975, Ser. No. 543,485
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R

240,065
TOY BARN
Henry Orenstein, 136 Lakeside Ave., Verona, N.J. 07044
Filed Feb. 10, 1975, Ser. No. 548,641
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL



240,066
TOY SAW
Matthew A. Moustakas, Mercerville, N.J., assignor to CBS Inc.
Original design application Feb. 19, 1974, Ser. No. 443,230. Divided and this application July 31, 1975, Ser. No. 601,114
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R

240,067
PLANTER OR SIMILAR ARTICLE
Robert Seymour Peets, Watchung, N.J., assignor to The Singer Company, New York, N.Y.
Filed Feb. 27, 1975, Ser. No. 553,707
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 B



240,068
WATER PUMP PLANTER
Gabriel Lopez, 4352 W. Belden, Chicago, Ill. 60639
Filed Sept. 22, 1975, Ser. No. 615,226
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 B

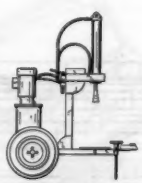
240,069
WATER WELL PLANTER
Gabriel Lopez, 4352 W. Belden, Chicago, Ill. 60639
Filed Sept. 22, 1975, Ser. No. 615,315
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 B

240,070
LAMP BASE
Eric Mulvany, New York, N.Y., assignor to Les Prismatiques Inc., New York, N.Y.
Filed Dec. 27, 1974, Ser. No. 536,877
Term of patent 14 years
Int. Cl. D6—*06;* D26—*05*
U.S. Cl. D48—20 R

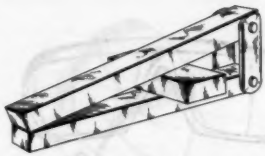
240,071
SWAG LAMP
Charles W. Lindquist, P.O. Box 133, Harvey, Ill. 60426
Filed Dec. 18, 1974, Ser. No. 533,873
Term of patent 7 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R

240,072
PALLETIZER ROLLER
E. Donald Glassner, Ellisville, and Harold W. Becker, St. Louis County, Mo., assignors to Urethane Roller Specialists, Inc.
Filed May 17, 1974, Ser. No. 470,735
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D55—1 C

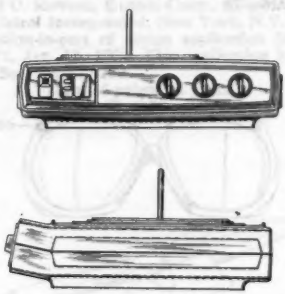
240,073
CORD WOOD SPLITTER
Warren W. Ebbinghaus, 2028 Warm Springs Ave., Boise, Idaho 83702
Filed Feb. 27, 1975, Ser. No. 553,458
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D55—1 A



240,074
ALUMINUM CONTAINER CRUSHER
Joe R. Smith, 509 Brookside Circle, Maitland, Fla. 32751
Filed Mar. 6, 1975, Ser. No. 555,979
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1 F



240,075
RECORD PLAYER
Kenneth R. Wilkes, Marcellus, N.Y., assignor to General Electric Company, Syracuse, N.Y.
Filed Nov. 7, 1973, Ser. No. 413,645
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4 R



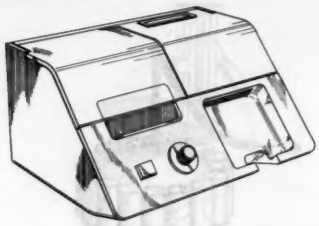
240,076
RADIO RECEIVER
Takeyoshi Kawano, Kyoto, and Kikuo Ohta, Katano, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan
Filed May 15, 1974, Ser. No. 470,099
Claims priority, application Japan Feb. 15, 1974
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

240,077
PAIR OF SPECTACLES
Anthony Shindler, Brookline, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Jan. 13, 1975, Ser. No. 540,744
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

240,078
PAIR OF SPECTACLES
Anthony Shindler, Brookline, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Jan. 13, 1975, Ser. No. 540,612
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—70

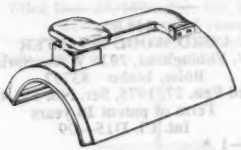
240,079
PAIR OF SPECTACLES
Anthony Shindler, Brookline, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Jan. 13, 1975, Ser. No. 540,745
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

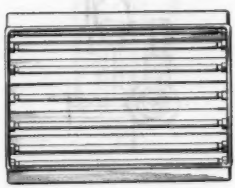
240,080
DUPLICATING MACHINE
Edward L. Brown, Pepper Pike, Ohio, ass'gnor to Addressograph-Multigraph Corporation, Cleveland, Ohio
Filed Sept. 3, 1974, Ser. No. 502,530
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D16—27



240,081
SEWING MACHINE PRESSER FOOT
Patricia E. Russo, P.O. Box 543 (or 422 W. Santa Clara), Santa Ana, Calif. 92702
Filed Jan. 27, 1975, Ser. No. 544,187
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D70—2 B

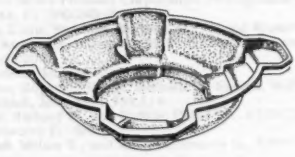
240,082
LAMP
Donald Charles Garwood, Malibu, Calif., assignor to Merck & Co., Inc., Rahway, N.J.
Filed Sept. 6, 1974, Ser. No. 503,909
Term of patent 14 years
Int. Cl. D23—*03*; D24—*02*
U.S. Cl. D83—1 C



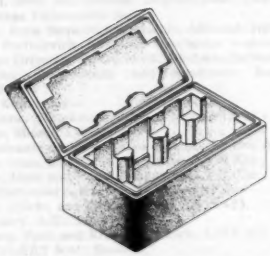


240,083
URINAL
Heinz H. W. Gregor, Toronto, Ontario, Canada (2438 Bloor St. W., Islington, Ontario M6S 1P9, Canada)
Filed Oct. 1, 1973, Ser. No. 402,084
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 U

240,084
BATHING POOL
Merle C. Melchior, Los Angeles, Calif., assignor to Hydro-Spa, Inc., Sherman Oaks, Calif.
Filed Jan. 18, 1974, Ser. No. 434,433
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D83—1 C

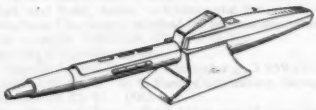


240,085
BIOLOGICAL STORAGE CONTAINER
Dennis J. Reisdorf, Santa Ana, Calif., assignor to Baxter Laboratories, Inc., Deerfield, Ill.
Filed Aug. 14, 1974, Ser. No. 497,430
Term of patent 14 years
Int. Cl. D9—*03;* D24—*99*
U.S. Cl. D83—1 U

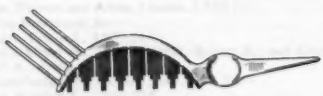


240,086
SPRAY SHIELD
Edward L. Riblett, Winter Park, Fla. (414 Piedmont St., Orlando, Fla. 32806), and John J. Davis, 2580 S. Orange Blossom Trail, Orlando, Fla. 32805
Filed Apr. 19, 1974, Ser. No. 462,214
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 A

240,087
COMBINED STEAM CURLING IRON AND STAND THEREFOR
Paul O. Rawson, Easton, Conn., assignor to Clairol Incorporated, New York, N.Y.
Continuation-in-part of design application Ser. No. 434,471, Jan. 18, 1974. This application May 14, 1975, Ser. No. 577,252
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 E



240,088
HAIR TEASING COMB
Linda K. Davis, Rte. 4, Box 184, Abingdon, Va. 24210
Filed Jan. 27, 1975, Ser. No. 544,659
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—8



240,089
STEAM CURLING IRON
Paul O. Rawson, Easton, Conn., assignor to Clairol Incorporated, New York, N.Y.
Filed Jan. 18, 1974, Ser. No. 434,471
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 E

240,090
PURSE
Milton I. Siegel, Scottsdale, Ariz., assignor to AMBA Marketing Systems, Inc., Tempe, Ariz.
Filed June 20, 1975, Ser. No. 588,892
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF MAY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See—*
Bixby, William E., 3,958,988.

A. E. Staley Manufacturing Company: *See—*
Eastman, James E., 3,959,514.

A. & H. Mfg. Co.: *See—*
Feibelman, Hans J., 3,958,788.

A.P.V. Company Limited, The: *See—*
Cohn, Ruth, 3,959,067.

A W & H Manufacturing Co., Inc.: *See—*
Garzelloni, Thomas L., 3,958,684.

Aaen, Olav; Rose, Edgar; and Prince, Anthony, to Outboard Marine Corporation. Transmission drive pulley assembly with selective drive and including ratchet mechanism. 3,958,461, Cl. 74-230.17E.

AB Celleco: *See—*
Frykhult, Rune Helmer; and Ek, Bo Knut, 3,959,150.

AB Id-Kort: *See—*
Hogberg, Goran, 3,959,630.

AB Karlstadplattan: *See—*
Eriksson, Erik Gustav Lennart, 3,959,195.

AB Svenska Foodco: *See—*
Grufstedt, Sven-Gunnar Henrik, 3,959,504.

AB Svenska Maskinverken: *See—*
Andersson, Sven Erik Alvar, 3,958,629.

Abegg, Jean-Louis; Boiteux, Jean-Pierre; and Hourseau, Colette, to L'Oreal. Cosmetic composition containing a cationic polymer and divalent metal salt for strengthening the hair. 3,958,581, Cl. 132-7.000.

Abel, Heinz: *See—*
Berger, Alfred; and Abel, Heinz, 3,958,931.

Abeta, Sadaharu: *See—*
Okaniwa, Tetsuo; and Abeta, Sadaharu, 3,958,287.

Abolins, Visvaldis: *See—*
Cooper, Glenn D.; and Abolins, Visvaldis, 3,959,211.

Aboud, Fred George. Multi-legged trash bag hoop. 3,958,785, Cl. 248-97.000.

Abraham, Gerald Milton; and Campbell, Peter John, to Bell Telephone Laboratories, Incorporated. Electrical connector. 3,958,852, Cl. 339-91.00P.

Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, to American Home Products Corporation. Prostaglandin intermediate. 3,959,263, Cl. 260-240.00R.

Abrahams, Louis; Hutchins, Burleigh M., Jr.; and Waters, James L., to Waters Associates, Incorporated. Pump control systems. 3,958,898, Cl. 417-36.000.

ACF Industries, Incorporated: *See—*
Akester, Roger L.; Dugge, Richard H.; Fossett, Wallace Lee; and Waddell, Jerry D., 3,958,514.
Dugge, Richard H.; and Rollins, Dallas W., 3,958,722.

Acker, Ellsworth G.: *See—*
Winyall, Milton E.; and Acker, Ellsworth G., 3,959,174.

Actron: *See—*
Meier, Michael J., 3,959,784.

Adams, Edward M.: *See—*
Everett, Woodrow W.; and Adams, Edward M., 3,958,771.

Adams, James S.; Peck, William H.; and Tekulve, Daniel R., to Hill-Rom Company, Inc. Elevating and Trendelenburg mechanism for an adjustable bed. 3,958,283, Cl. 5-66.000.

Adams, Jim Mills; and Kaetzel, Gilbert Carl, to Hoffmann-La Roche Inc. High-speed multi-channel feeder for tablets. 3,958,687, Cl. 198-220.0BA.

Addressograph Multigraph Corporation: *See—*
Booth, Thomas A., 3,959,801.

Adelmann, John Charles, to Johns-Manville Corporation. Less abrasive composition railroad brake shoe material. 3,959,194, Cl. 260-17.200.

Advanced Materials Engineering Limited: *See—*
Egenolf, John; and Osborne, Stephen John, 3,958,924.

Agafonov, Ivan Fedorovich: *See—*
Somov, Boris Stepanovich; Mamin, Alexandr Ilich; Novikov, Andrei Porfirievich; Filippov, Vyacheslav Ivanovich; Khirdzhiev, Sergei Grigorievich; Gurevich, Vladimir Zakharovich; Voronov, Nikolai Stepanovich; and Agafonov, Ivan Fedorovich, 3,958,438.

Agatsuma, Kunio: *See—*
Nakamura, Yasushi; Agatsuma, Kunio; Tanaka, Yoshihiro; and Aono, Shunji, 3,959,484.

Agence Nationale de Valorisation de la Recherche Anvar: *See—*
Marine, Jean; and Rodot, Huguette, 3,959,026.
Marine, Jean; and Rodot, Huguette, 3,959,026.

Agency of Industrial Science & Technology: *See—*
Torikai, Eiichi; and Kawami, Yoji, 3,959,453.

AGFA-Gevaert, A.G.: *See—*
Feneberg, Paul; and Krekeler, Ulrich, 3,959,105.

AGFA-GEVAERT N.V.: *See—*
Poot, Albert Lucien; Lemahieu, Raymond Gerard; Janssens, Wilhelmus; and de Jaeger, Antoine August, 3,958,815.
Stievenart, Emile Frans; Deconinck, Hugo Frans; and Ceuppens, Willy Gabriel, 3,959,654.

Agricola, Francis Oswald; Briner, William Watson; Granger, Robert James; and Widder, James Stone, to Procter & Gamble Company, The. Oral compositions for calculus retardation. 3,959,458, Cl. 424-52.000.

Agrotechnika, narodny podnik: *See—*
Mackrle, Svatopluk; and Mackrle, Vladimir, 3,959,144.

Ahiko, Kenkichi: *See—*
Niki, Hiroshi; Deya, Eiki; Doi, Toru; Igarashi, Seiichiro; Ahiko, Kenkichi; and Hayashi, Hiromichi, 3,959,517.

Aichi Steel Works, Ltd.: *See—*
Aoyama, Shigetsune; Kato, Masahiko; Matsubara, Motoo; and Furuta, Osamu, 3,958,732.

Ainsworth, Anthony Trevor; and Rose, Carl John, to Beecham Group Limited. Acylamino imidazoles. 3,959,305, Cl. 260-309.000.

Air-Dry Corporation: *See—*
Sheldon, Robert S.; and Whitten, David E., 3,958,599.

Air Products and Chemicals, Inc.: *See—*
Berrettini, Bruce Joseph, 3,958,443.

Airco, Inc.: *See—*
Marancik, William G.; Ormand, Frederick T.; and Gregory, Eric, 3,958,327.

Airpax Electronics Incorporated: *See—*
Harper, George S.; and Merriken, Lyal N., 3,959,755.

Aizawa, Tatsuo: *See—*
Washio, Takaji; Nakajima, Tadanobu; Miyoshi, Hideo; Yoshioka, Masahiro; and Aizawa, Tatsuo, 3,958,880.

Akerblom, Carl-Artur, to Allmanna Svenska Elektriska Aktiebolaget. Method of providing an object of silicon steel with a heat-resistant, electrically insulating coating. 3,959,034, Cl. 148-113.000.

Akester, Roger L.; Dugge, Richard H.; Fossett, Wallace Lee; and Waddell, Jerry D., to ACF Industries, Incorporated. Automatic hopper gate locking mechanism. 3,958,514, Cl. 105-282.00A.

Aktiebolaget Astra: *See—*
Dahlbom, Johan Richard; Karlen, Bo Lennart; and Lindgren, Sune Gunnar, 3,959,311.

Aktiebolaget Wicanders Korkfabriker: *See—*
Harding, Sune; and Andersson, Per-Ake, 3,958,710.

Akzona Incorporated: *See—*
Fink, Roger H.; and Porter, William D., 3,958,734.
Witz, Samuel; and Hartung, Walter H., 3,959,081.

Al-Hassan, Saieba: *See—*
Wood, Hamish Christopher Swan; Stuart, Alexander; Curran, Adrian Charles Ward; and Al-Hassan, Saieba, 3,959,278.

Al, Rene J.; and Henry, Ralph E., to Dresser Industries, Inc. Corrosion resistant valve construction. 3,958,595, Cl. 137-375.000.

Alais, Michel; and Stahl, Andre, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Method for the manufacturing of thermoelectric modules. 3,958,324, Cl. 29-573.000.

Alar Engineering Corporation: *See—*
White, Harold R.; and Doncer, Alexander J., 3,959,129.

Albee, Percy Frederick, Jr., to Q-Panel Corporation. Newspaper log maker. 3,958,499, Cl. 93-1.00C.

Alberts, Gene Stoddard; Farrar, Paul Alden; and Hallen, Robert Lee, to International Business Machines Corporation. Method for constructing a rom for redundancy and other applications. 3,959,047, Cl. 156-8.000.

Albright, Charles W.; and Keller, George E., II, to Union Carbide Corporation. Process for cracking. 3,959,401, Cl. 260-683.00R.

Alexander, Leon Rollin; and Dreher, Donald F. Method and apparatus for flocking continuous webs. 3,959,059, Cl. 156-244.000.

Alexandrov, Adolf Moritsovich: *See—*
Bogdanov, Alexei Alexeevich; Fonarev, Zakhar Izrailevich; Khorkov, Viktor Petrovich; Alexandrov, Adolf Moritsovich; Iosilevich, Ninel Rafailovna; Shitov, Vyacheslav Vladimirovich; Darier, Yakov Shamilievich; Peller, Vsevolod Vladimirovich; and Kostygov, Alexandr Sergeevich, 3,959,622.

Alink, Bernardus A. Oude; and Redmore, Derek, to Petrolite Corporation. Preparation of dithiolium compounds. 3,959,313, Cl. 260-327.00C.

Allain, Ronald J., to Nalco Chemical Company. Diethers of polyalkylene glycol. 3,959,391, Cl. 260-615.00B.

Allais, Lucien: *See—*
Mardine, Pierre; and Allais, Lucien, 3,959,111.

Allen-Bradley Company: *See—*
Graninger, Frank J., 3,959,614.
Zaffrann, Albert A., Jr.; Borchardt, Robert E.; and Grabarczyk, Frank A., 3,959,615.

Alliance Manufacturing Company, Inc., The: *See—*
Deming, Andrew F., 3,959,756.

Allias, Bernard, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Device for synchronizing a receiver of numerical data. 3,959,587, Cl. 178-69.50R.

Allied Chemical Corporation: *See—*
Nienart, Louis F., 3,958,728.

Yeh, Chuen Y.; and Ulmer, Harry E., 3,959,382.

Allinquant, Fernand Michel; and Allinquant, Jacques Gabriel. Hydraulic shock absorber and base partition structure. 3,958,673, Cl. 188-322.000.

Allinquant, Jacques Gabriel: *See—*
Allinquant, Fernand Michel; and Allinquant, Jacques Gabriel, 3,958,673.

Allis-Chalmers Corporation: *See—*
Boyd, Donald R., 3,959,667.
Finlayson, Thomas J.; Grace, Michael H.; and Smith, George H., 3,959,608.
Marco, George P.; and Krutis, Edward V., 3,958,703.

Allison, David F., to Signetics Corporation. High inverse gain transistor. 3,959,809, Cl. 357-34.000.

Allman, Charles E., to Dictaphone Corporation. Gas analyzing element. 3,959,764, Cl. 338-34.000.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Akerblom, Carl-Artur, 3,959,034.
Lundquist, Bertil; Nilsson, Harald; and Zinck-Petersen, Jorgen, 3,959,145.

Allport, Maurice James; and Williams, David Gordon, to Lucas Electrical Company Limited, The. Battery charging systems for road vehicles. 3,959,708, Cl. 320-48.000.

Allsop, Ivor J.; Allsop, Jon I.; Allsop, Michael G.; and Allsop, James D. Shoe merchandizing and handling apparatus. 3,958,695, Cl. 211-37.000.

Allsop, James D.: *See—*
Allsop, Ivor J.; Allsop, Jon I.; Allsop, Michael G.; and Allsop, James D., 3,958,695.

Allsop, Jon I.: *See—*
Allsop, Ivor J.; Allsop, Jon I.; Allsop, Michael G.; and Allsop, James D., 3,958,695.

Allsop, Michael G.: *See—*
Allsop, Ivor J.; Allsop, Jon I.; Allsop, Michael G.; and Allsop, James D., 3,958,695.

Alpha Industries, Inc.: *See—*
Borzym, John J., 3,958,467.

Aluminum Company of America: *See—*
Haddon, Roger C.; and Habets, Jean-Pierre J., 3,958,441.
Pope, Roy M., 3,959,439.
Willis, Wilburn C.; Denhart, William L.; Kelly, Frank M.; and Clements, Joseph A., 3,958,448.

Amano Pharmaceutical Co., Ltd.: *See—*
Kobayashi, Mizuho, 3,959,467.

Amano, Yasuji: *See—*
Nishino, Atsushi; Kumano, Hiroshi; Noguchi, Yoshinori; Sonetaka, Kazunori; and Amano, Yasuji, 3,959,021.

Amax Inc.: *See—*
Arend, Carl A., Jr., 3,959,112.
Queneau, Paul B.; Symens, Raymond D.; and Chou, Eddie C., 3,959,097.

American Air Filter Company, Inc.: *See—*
Huppi, Xaver Johann; and Frauenfelder, Alfred, 3,958,844.

American Bioculture, Inc.: *See—*
Schenck, Paula; Foster, Patricia L.; Walker, William W., Jr.; and Fogel, Samuel, 3,958,364.

American Chain & Cable Company, Inc.: *See—*
Shaffer, Christ N., 3,958,617.

American Cyanamid Company: *See—*
Blank, Werner Josef, 3,959,202.
Chang, Eugene Yue Chieh; and Li, Tsi Tieh, 3,959,227.

American Hoechst Corporation: *See—*
Bauer, Victor J.; and Kosley, Raymond W., Jr., 3,959,475.
Burnett, Leo S., 3,958,994.

American Home Products Corporation: *See—*
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 3,959,263.
Strike, Donald P., 3,959,363.

American Hospital Supply Corporation: *See—*
Rockett, Thomas J.; and O'Connell, John J., 3,959,212.

American Optical Corporation: *See—*
Welter, Leonard M., 3,959,651.
Woodcock, Richard Forrest, 3,959,171.

American Potato Company: *See—*
Shatila, Mounir A., 3,959,501.

American Safety Equipment Corporation: *See—*
Sugar, Joseph, 3,958,773.

Ametek, Inc.: *See—*
Krynski, John E.; and Laugel, Roland L., 3,959,148.
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AMF Incorporated: *See—*
Ketchum, Frank W., 3,958,551.

an der Heiden, Rainer: *See—*
Rotter, Gerhard; Buchan, William A.; and an der Heiden, Rainer, 3,959,815.

Anchor Hocking Corporation: *See—*
Nixdorff, Frank S., 3,958,709.

Andeno B.V.: *See—*
de Heij, Nicolaas A.; and Hendrickx, Andreas J. J., 3,959,388.

Anderson, Bruce W., to Bendix Corporation, The. Brake actuating apparatus including piston and adjust/reset means. 3,958,670, Cl. 188-196.00R.

Anderson, Frohman. Dynamically controlled forming by drawing machine. 3,958,436, Cl. 72-17.000.

Anderson, John R.; and Boros, Steve, to General Electric Company. Miniature lamp construction and method of manufacture. 3,959,684, Cl. 313-318.000.

Anderson, Lawrence W.: *See—*
Woods, David H.; and Anderson, Lawrence W., 3,958,781.

Anderson, Ralph F. Adjustable multiple container dispensing apparatus. 3,958,720, Cl. 221-93.000.

Anderson, Robert J., to Rust Engineering Company. System for controlling the operation of a multiple hearth furnace. 3,958,920, Cl. 432-23.000.

Anderson, Steven Jon, to Chemsep Corporation. Extraction method for non-ferrous metals. 3,958,985, Cl. 75-117.000.

Andersson, Per-Ake: *See—*
Harding, Sune; and Andersson, Per-Ake, 3,958,710.

Andersson, Sven Erik Alvar, to AB Svenska Maskinverken. Fluid receptacle having at least one heat exchanging unit detachably mounted therein. 3,958,629, Cl. 165-74.000.

Andreas Stihl Maschinenfabrik: *See—*
Armbruster, Herbert; Schilling, Wolfgang; and Wieland, Dieter, 3,958,680.

Andreeva, Natalia Ivanovna: *See—*
Mashkovsky, Mikhail Davidovich; Glushkov, Robert Georgievich; Andreeva, Natalia Ivanovna; Smulevich, Anatoly Boleslavovich; Avrutsky, Grigory Yakovlevich; and Gromova, Valentina Vasilievna, 3,959,470.

Angliker, Hans-Jorg: *See—*
Graff, Gustaf; Angliker, Hans-Jorg; Peter, Richard; Milicevic, Branimir; Hoster, Hansruedi; and Defago, Raymond, 3,958,933.

Angstadt, Howard P.: *See—*
Bushick, Ronald D.; and Angstadt, Howard P., 3,959,336.
Bushick, Ronald D.; and Angstadt, Howard P., 3,959,337.

Anheuser-Busch, Incorporated: *See—*
Hunt, Walter G.; and Kovats, Leslie P., 3,959,169.

Anichini, Cesare, to Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C. Measuring system for direct feeling gauge. 3,958,337, Cl. 33-143.00L.

Anichini, Cesare; and Possati, Mario, to Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C. Gauge with electric position transducers to measure the sizes of mechanical workpieces. 3,958,338, Cl. 33-178.00E.

Animatic Company Limited: *See—*
Bowry, Anthony David; and Francis, Christopher, 3,958,875.

Ansari, Azizullah N.; Lambrecht, Richard M.; Redvanly, Carol S.; and Wolf, Alfred P., to United States of America, Energy Research and Development Administration. Labeling of indocyanine green with carrier-free iodine-123. 3,959,455, Cl. 424-1.000.

Antonini, Eraldo, to Officina Terapeutica Italiana O.T.I. Laboratorio Biologico S.p.A. Method for isolating transferrines from biological materials. 3,959,249, Cl. 260-122.000.

Antos, George J., to Universal Oil Products Company. Hydrocarbon conversion with an acidic multimetallic catalytic composite. 3,959,121, Cl. 208-139.000.

Antypas, George A., to Varian Associates. Process for making III-V devices. 3,959,045, Cl. 156-3.000.

Aoki, Hisashi: *See—*
Nakajima, Nobuo; Aoki, Hisashi; Fujino, Masahiko; Nishimura, Osamu; Wakimasu, Mitsuhiro; and Mano, Mitsuhiko, 3,959,245.

Aoki, Katsumi: *See—*
Urakami, Fukashi; Yamashita, Hiroyuki; and Aoki, Katsumi, 3,958,652.

Aono, Shunji: *See—*
Nakamura, Yasushi; Agatsuma, Kunio; Tanaka, Yoshihiro; and Aono, Shunji, 3,959,484.

Aoyama, Shigetsune; Kato, Masahiko; Matsubara, Motoo; and Furuta, Osamu, to Kabushiki Kaisha Toyota Chuo Kenkyusho; and Aichi Steel Works, Ltd. Method for breaking steel rod into billets. 3,958,732, Cl. 225-2.000.

Aoyama, Toshikazu; Kimata, Yukinori; Okasaka, Hotuma; Kodama, Hiroshi; and Yoda, Naoya, to Toray Industries, Inc. Thermoplastic resin composition having reduced flammability. 3,959,219, Cl. 260-45.75B.

Appenzeller, Valentin: *See—*
Kusters, Eduard; and Appenzeller, Valentin, 3,958,311.

Arai, Mamoru, to Eisai Co., Ltd. Apparatus for cutting a moving object into a predetermined length. 3,958,481, Cl. 83-311.000.

Arai, Tohru: *See—*
Komatsu, Noboru; Arai, Tohru; and Sugimoto, Yoshihiko, 3,959,092.

Arashi, Masanori; Shimada, Hisahiko; Fujituka, Shigeyuki; Kamiya, Kimio; and Miyazaki, Tomoyuki, to Wako Pure Chemical Industries, Ltd. Process for producing hydrazonitriles. 3,959,343, Cl. 260-465.50R.

Arend, Carl A., Jr., to Amax Inc. Device for providing uniform air distribution in air-agitated electrowinning cells. 3,959,112, Cl. 204-273.000.

Arey, William Floyd, Jr.; and Hamner, Glen Porter, to Exxon Research and Engineering Company. Reforming process utilizing a dual catalyst system. 3,959,116, Cl. 208-66.000.

Arima, Shizuo: *See—*
Toyoda, Akira; and Arima, Shizuo, 3,958,902.

Arkell, Alfred; Riedl, Peter A.; and Kerr, Edwin R., to Texaco Inc. Phenol and cyclohexanone manufacture. 3,959,381, Cl. 260-586.00R.

Arlington Trust Company: *See—*
Sousa, Henry P., 3,959,600.

Armbruster, Herbert; Schilling, Wolfgang; and Wieland, Dieter, to Andreas Stihl Maschinenfabrik. Motor chain saw with plural clutches and a brake. 3,958,680, Cl. 192-48.500.

Armitage, Bernard J.; Jeffery, James E.; Nicholson, John S.; and Tantum, James G., to Boots Company Limited, The. Preparation of arylalkanoic acids. 3,959,364, Cl. 260-515.00R.

Armstrong Cork Company: *See—*
Young, John H., 3,959,428.

Arning, Klaus H.; and Rumpf, Robert J., to Ford Motor Company. Motor vehicle chassis subassembly. 3,958,653, Cl. 180-157.000.

Arnold, Franz; and Boehm, Oscar. Angle setting mechanism, in particular for vises. 3,958,335, Cl. 33-75.00R.

Aronoff, Edward I. Apparatus for treating tubular fabrics. 3,958,432, Cl. 68-13.00R.

Arrington, William Lee; Gantt, Robert Dwight; Gausman, Thomas Edward; and Snyder, Glen Edward, to GTE Sylvania Incorporated. Spark gap apparatus. 3,958,854, Cl. 339-111.000.

Arvanitakis, Kostas Savas. Apparatus for filtering cooking liquids. 3,959,143, Cl. 210-196.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Kimoto, Masakazu; and Shimonishi, Isoo, 3,959,559.

Asarco Incorporated: *See—*
Henderson, James M.; and Wetherill, William H., 3,959,451.

Ashcroft, Richard I., to Owens-Illinois, Inc. Method and apparatus for producing plastic-covered containers. 3,959,065, Cl. 156-423.000.

Asinger, Friedrich; and Offermanns, Heribert, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the splitting of the racemate of d-1-phenylpropanolamine. 3,959,302, Cl. 260-306.70C.

Asmussen, Daniel R.; and Ma, Ray, to Tel-Tone Corporation. Identification forwarding circuit for use with tone-to-pulse converters. 3,959,598, Cl. 179-16.0EC.

Astra Lakemedel Aktiebolag: *See—*
Eriksson, Hans Erik; and Florvall, Gosta Lennart, 3,959,476.

Atlantic Richfield Company: *See—*
Dransfield, Clifford D.; and Wise, Phillip W., 3,958,661.
Perkins, Thomas K., 3,958,636.

Atlas, Ronald M.: *See—*
Bartha, Richard; and Atlas, Ronald M., 3,959,127.

Atomic Energy of Canada Limited: *See—*
Schriber, Stanley O., 3,959,687.

Atterbury, Robert Edwin, to Foseco Trading A.G. Hot top lining slabs and sleeves. 3,958,998, Cl. 106-38.220.

Auge, Wolfgang: *See—*
Thiem, Karl-Werner; Auge, Wolfgang; and Neeff, Rutger, 3,959,317.

Augerscope, Inc.: *See—*
Irwin, Lawrence F., 3,958,293.

August Bilstein, Firma: *See—*
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Auto Research Corporation: *See—*
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Automobiles Peugeot: *See—*
LeSalver, Robert; and Poupard, Dominique, 3,958,654.

Auzel, Francois E. Method of casting fluorescent lenses. 3,958,970, Cl. 65-33.000.

Avar, Lajos; and Hofer, Kurt, to Sandoz Ltd. Organic compounds. 3,959,265, Cl. 260-242.000.

Avrutsky, Grigory Yakovlevich: *See—*
Mashkovsky, Mikhail Davidovich; Glushkov, Robert Georgievich; Andreeva, Natalia Ivanovna; Smulevich, Anatoly Boleslavovich; Avrutsky, Grigory Yakovlevich; and Gromova, Valentina Vasilievna, 3,959,470.

Ayer, George Edward, to Bunker Ramo Corporation. Method and apparatus for connecting multi-conductor cables. 3,958,850, Cl. 339-22.000.

Ayers, Ray R.; and Hemphill, Dean P., to Shell Oil Company. Oil spill cleanup method and apparatus. 3,959,136, Cl. 210-83.000.

B.F. Goodrich Company, The: *See—*
Dunn, Bobby Eugene, 3,959,341.

Baalsrud, Nils-Ivar; Ore, Svein; and Velle, Weiert, to Rumen Chemie, AG. Rumen bypass products comprising biologically active substances protected with aliphatic fatty acids. 3,959,493, Cl. 426-2.000.

Baba, Arimasa: *See—*
Hayashi, Kiyoshige; Nakaniwa, Mikio; Yamamoto, Minoru; Ozaki, Kazuo; and Baba, Arimasa, 3,959,115.

Babcock & Wilcox Company, The: *See—*
Cooper, Adrianus A. G., 3,958,805.
McIlroy, Robert A.; Matty, Robert E.; and Lapple, Walter C., 3,959,068.

Bach, Nicholas J.; and Kornfeld, Edmund C., to Eli Lilly and Company. 8-Oxymethylergolines and process therefor. 3,959,288, Cl. 260-285.500.

Bader, Christian, to Deutsche Automobilgesellschaft mbH, Firma. Drive system for electrically driven vehicles. 3,959,701, Cl. 318-139.000.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Nienburg, Hans Juergen; Kniese, Wilhelm; Kummer, Rudolf; and Tavs, Peter, 3,959,385.

Baessler, Konrad: *See—*
Szczepanski, Norbert; and Baessler, Konrad, 3,959,392.

Bagli, Jehan F.: *See—*
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 3,959,263.

Bailey, August V.; and Sumrell, Gene, to United States of America, Agriculture. Hair cream rinse formulations containing quaternary ammonium salts. 3,959,461, Cl. 424-70.000.

Baird-Atomic, Inc.: *See—*
Turner, Arthur S., 3,958,883.

Baker-Alpha Corporation: *See—*
Baker, Jack C., 3,958,579.

Baker, Edward A., to Sun Pipe Line Company. Semi-automatic valve control for a prover loop. 3,958,444, Cl. 73-3.000.

Baker, Jack C., to Baker-Alpha Corporation. Cigarette filter. 3,958,579, Cl. 131-10.500.

Baker, Lamar. Egg cracking machine. 3,958,505, Cl. 99-495.000.

Baker Research Development Service, Inc.: *See—*
Jackel, Simon S.; and Diachuk, Volodymyr R., 3,959,496.

Baker, Roger E.; and Vetsch, Le Roy E., to Eldec Corporation. Mass flowmeter. 3,958,447, Cl. 73-32.00R.

Bakerdrill, Inc.: *See—*
Curington, Alfred R., 3,958,645.

Bakke, Even, to United States Filter Corporation. Wet electrostatic precipitators. 3,958,960, Cl. 55-118.000.

Bakke, Even, to United States Filter Corporation. Wet electrostatic precipitators. 3,958,961, Cl. 55-118.000.

Balaz, Alexander; Bone, David P.; and Shannon, Edward L., to Quaker Oats Company, The. Method of making a dry fibrous meat-like pet food and composition thereof. 3,959,511, Cl. 426-549.000.

Balser, Charles W.: *See—*
Greene, Herbert R.; and Balser, Charles W., 3,959,611.

Bandera, Robert, to GEDIC. Automatic screwdriving machine. 3,958,614, Cl. 144-32.00R.

Banhidy, Detre M.: *See—*
Williams, Harrison L.; and Banhidy, Detre M., 3,958,379.

Bannon, John; Goldman, Steve; and Lametto, Richard A., to Nash Engineering Company, The. Insert for movable diaphragm type flow control valve. 3,958,603, Cl. 138-43.000.

Barbee, Wilford O., to Iowa Beef Processors, Inc. Machine for washing tripe. 3,958,304, Cl. 17-43.000.

Barden Corporation, The: *See—*
Donner, William E., 3,958,846.

Barigot, Jean-Claude: *See—*
Merlet, Pierre; Vernezy, Jacques; and Barigot, Jean-Claude, 3,959,606.

Barillo, Joseph; Payne, Thomas A., Jr.; and Urban, Warren J., to Lever Brothers Company. Perfume blend including 2-keto-6-substituted-dioxanes-(1,4). 3,959,185, Cl. 252-522.000.

Barisoni, Mario; Barteri, Massimo; Brozzo, Pietro; Marianeschi, Edmondo; and Bitti, Roberto Ricci. Process for manufacturing silicon-aluminum steel sheet with oriented grains for magnetic applications, and products thus obtained. 3,959,033, Cl. 148-112.000.

Barkelew, Richard C. Valve with radially expansive valve plug. 3,958,792, Cl. 251-304.000.

Barker, Michael Harris; and Roberts, Alan Gregson, to British Coal Utilization Research Association Limited, The. Distributor plate. 3,958,916, Cl. 431-170.000.

Barlow, Michael L.: *See—*
Nees, Donald M.; Lindstrum, Alan L.; and Barlow, Michael L., 3,959,766.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
Lenk, Erich, 3,958,473.

Barnette, L. H.: *See—*
Liang, C. C.; and Barnette, L. H., 3,959,012.

Baronnet, Pierre: *See—*
Pollinger, Hans; Huber, Erich; Baronnet, Pierre; and Kugler, Walter, 3,958,513.

Barorian, Seew. Process for manufacturing metal poles. 3,958,437, Cl. 72-55.000.

Barrett, Fred O.: *See—*
Sturwold, Robert J.; and Barrett, Fred O., 3,959,560.

Barriere, Andre; and Rough, Pierre, to Commissariat a l'Energie Atomique. Heat-insulating structure. 3,958,714, Cl. 220-10.000.

Barron, Margaret, to Lawrence Peska Associates, Inc., a part interest. Ornamental ear clip with retaining means pressing against the ear and head. 3,958,430, Cl. 63-14.00A.

Barteri, Massimo: *See—*
Barisoni, Mario; Barteri, Massimo; Brozzo, Pietro; Marianeschi, Edmondo; and Bitti, Roberto Ricci, 3,959,033.

Bartha, Kenneth J., to Houdaille Industries, Inc. Punching device with punch retainer. 3,958,476, Cl. 83-143.000.

Bartha, Richard; and Atlas, Ronald M., to United States of America, Navy. Biodegradation of oil on water surfaces. 3,959,127, Cl. 210-11.000.

BASF Aktiengesellschaft: *See—*
Hartmann, Job Werner; Ostertag, Werner; Sand, Rudolf; Schaefer, Dieter; and Hartmann, Hans Joerg, 3,959,553.
Koester, Eberhard; Wunsch, Gerd; Deigner, Paul; Graw, Dieter; Uhl, Karl; and Steck, Werner, 3,959,032.
Rotter, Gerhard; Buchan, William A.; and an der Heiden, Rainer, 3,959,815.

Baskin, Yehuda, to Ferro Corporation. Friction material containing spinel as friction modifier. 3,959,208, Cl. 260-38.000.

Bassani Manufacturing: *See—*
Nakamura, David S., 3,958,967.

Batchelor, John Frederick: *See—*
Hodson, Harold Francis; and Batchelor, John Frederick, 3,959,482.

Bauer, Frederick T.; and Geary, Frederick J., to Robertshaw Controls Company. Oil burner safety control system with integral ignition. 3,959,697, Cl. 317-151.000.

Bauer, Lieselotte: *See—*
Krueger, Friedrich; Bauer, Lieselotte; and Michel, Walter, 3,959,361.

Bauer, Martin; Ewe, Henning; and Justi, Eduard, to Varta Batterie Aktiengesellschaft; and Siemen AG, part interest to each. Method to produce a protective oxide on the surface of positive nickel electrodes for galvanic cells. 3,959,014, Cl. 136-29.000.

Bauer, Richard G.: *See—*
Guillod, Mark S.; and Bauer, Richard G., 3,959,550.

Bauer, Victor J.; and Kosley, Raymond W., Jr., to American Hoechst Corporation. Substituted 1,3-dihydrospiro(isobenzofuran)s. 3,959,475, Cl. 424-267.000.

Bausch & Lomb Incorporated: *See—*
Doonan, Douglas D.; and Sakaida, Roy R., 3,958,938.

Baxmann, Fritz: *See—*
Frese, Albert; Baxmann, Fritz; Dittmann, Walter; and Dietrich, Johann, 3,959,409.

Baxter, Bobby G. Method for moving and aligning modular house units onto a foundation. 3,958,705, Cl. 214-152.000.

Bayer Aktiengesellschaft: *See—*
Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 3,959,296.
Brack, Alfred; and Schmitt, Ernst, 3,959,310.
Dieterich, Dieter; Markusch, Peter; and Dietrich, Werner, 3,959,329.
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Hornle, Reinhold; Molls, Hans-Heinz; Rupp, Roland; and Kuth, Robert, 3,958,929.
Konig, Hans-Bodo; Schrock, Wilfried; Disselnkotter, Hans; and Metzger, Karl Georg, 3,959,258.
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Bayerische Motoren Werke Aktiengesellschaft: *See—*
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Beck, James E., to Bell & Howell Company. Sound motion picture camera. 3,958,869, Cl. 352-35.000.

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Bell, Harvey Maxwell, to Timex Corporation. Termination device from hairspring-hub to drive coil on two conductor hairspring. 3,958,410, Cl. 58-107.000.

Bell & Howell Company: *See—*
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Benning, Calvin J., to International Paper Company. Method of making a retention catheter and molding a tip thereon. 3,959,429, Cl. 264-155.000.

Bennington, William E. Swab applicator. 3,958,571, Cl. 128-269.000.

Berger, Alfred; and Abel, Heinz, to Ciba-Geigy AG. Wool dyeing with epihalohydrin or chloroacetamide quarternized polyglycolamine assisted dye solution. 3,958,931, Cl. 8-43.000.

Bergman, Joseph, to Nagle, Spillman & Bergman, Inc. Process for blended food product. 3,959,500, Cl. 426-104.000.

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Berkowitz, Irving L., to Kason Hardware Corporation. Joint connector for connecting tubes. 3,958,889, Cl. 403-172.000.

Bernal, Enrique G., to Honeywell Inc. Graded composition coatings for surface protection of halide optical elements. 3,959,548, Cl. 428-212.000.

Bernhoft, Gerald W., to Koehring Company. Air-oil amplifier. 3,958,495, Cl. 91-433.000.

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Berrettini, Bruce Joseph, to Air Products and Chemicals, Inc. Apparatus for proving and calibrating cryogenic flow meters. 3,958,443, Cl. 73-3.000.

Berry, Alan R., to Minnesota Mining and Manufacturing Company. Wear-resistant, nonabrading tic article and process for making. 3,959,557, Cl. 428-368.000.

Berthoux, Jean; and Schwachhofer, Ghislain, to Rhone-Progil. Manufacture of alkyl esters of polycarboxylic acids. 3,959,347, Cl. 260-468.00K.

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Bevilacqua, Frank, to Combustion Engineering, Inc. Method and apparatus for a nuclear reactor for increasing reliability to scram control elements. 3,959,071, Cl. 176-36.00R.

Beyerle, Rudi; Stachel, Adolf, deceased; Stachel, Ingeburg Lydia Katharina, heiress; Nitz, Rolf-Eberhard; Resag, Klaus; and Schraven, Eckhard, to Cassella Farbwerke Mainkur Aktiengesellschaft. Piperazino substituted coumarin derivatives. 3,959,281, Cl. 260-268.0BC.

Bickoff, Emanuel M.; de Fremery, Donald; Edwards, Richard H.; Knuckles, Benny E.; Kohler, George O.; and Miller, Raymond E., to United States of America, Agriculture. Preparation of soluble edible protein from leafy green crops. 3,959,246, Cl. 260-112.00R.

Bil, Milos S., to Clairol Incorporated. Method for preparing 2-nitro-4-amino-N-phenylaniline. 3,959,377, Cl. 260-576.000.

Binder and Co., Aktiengesellschaft: *See—*
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Bird, David A.: *See—*
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Bissinger, William E.; Hardies, Donald E.; and Lavanish, Jerome M., to PPG Industries, Inc. Control of mites with polychloro parathio phenols. 3,959,487, Cl. 424-337.000.

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Bittner, Clarence W.; and Schlaffer, Walter G., to Shell Oil Company. Method for catalyst preparation. 3,959,180, Cl. 252-455.00Z.

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Bizerba-Werke Wilhelm Kraut K.G.: *See—*
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Blairsdale, Donald A. Electrical plug. 3,958,849, Cl. 339-14.00P.

Blanc, Charles; and DeLarue, Christian, to Rhone-Poulenc-Textile. Method for interlacing filaments of multifilament yarns. 3,958,310, Cl. 28-72.120.

Blank, Izhak, to Hydrophilics International, Inc. Sustained release polymers. 3,959,237, Cl. 526-16.000.

Blank, Werner Josef, to American Cyanamid Company. Composition of matter comprising a blend of certain polyether polyols, certain vinyl emulsion polymers and an aminoplast cross-linking agent. 3,959,202, Cl. 260-29.4UA.

Bleh, Otto: *See—*
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Blinow, Igor, to Polaroid Corporation. Adjustable dual action switch. 3,959,805, Cl. 354-202.000.

Block, Bruce E.; and Stohlquist, Roger H., to Rockford Automation, Inc. Adjustable cam actuated switch mechanism. 3,958,463, Cl. 74-568.00R.

Blomenkamp, Robert William, to Physics International Company. Frequency burst communication system. 3,959,586, Cl. 178-66.00R.

Blondel, Jean-Claude Rene Georges; Fouche, Jean Clement Louis; and Gueremx, Claude Georges Alexandre, to Rhone-Poulenc, S.A. Phenthiazine derivatives. 3,959,268, Cl. 260-243.00A.

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Blue M Electric Company: *See*—
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Blum, Arnold; Irro, Fritz; and Sonntag, Guenther, to International Business Machines Corporation. Highly available computer system. 3,959,638, Cl. 235-153.0AK.

Bobtex Corporation Limited, The: *See*—
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Boehm, Oscar: *See*—
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Boenisch, Dietmar. Apparatus for mixing materials. 3,958,795, Cl. 259-2.000.

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Bogdanov, Alexei Alexeevich; Fonarev, Zakhar Izrailevich; Khorkov, Viktor Petrovich; Alexandrov, Adolf Moritsovich; Iosilevich, Ninel Rafailovna; Shitov, Vyacheslav Vladimirovich; Darier, Yakov Shamilievich; Peller, Vsevolod Vladimirovich; and Kostygov, Alexandr Sergeevich. Flexible electric heater element. 3,959,622, Cl. 219-549.000.

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Bohm, Harald: *See*—
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Bohm, Walter. Ski with top edge portions of plastic material and device for securing the edge portions during manufacture. 3,958,810, Cl. 280-610.000.

Bohun, Robert Edward: *See*—
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Boiteux, Jean-Pierre: *See*—
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Bojanek, Robert J.; Field, Robert G.; and Mason, Marvin S., to GTE Sylvania Incorporated. Time division switching network. 3,959,596, Cl. 179-15.0AT.

Bolt Associates, Inc.: *See*—
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Bolton, Lorne F.: *See*—
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Bonazoli, Robert P.; and Kirkhuff, Ellison H., to GTE Sylvania Incorporated. Control circuit for xenon flash tubes. 3,959,688, Cl. 315-240.000.

Bondra, John, Jr.; and Ruhling, William R., to Metal Buildings Insulation, Inc. Insulation blanket and method and apparatus for making same. 3,958,385, Cl. 52-404.000.

Bone, David P.: *See*—
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Boney, William G.: *See*—
Mikulicz, Michael Z.; Boney, William G.; and Vora, Bipin V., 3,959,402.

Bonis, Maurice; and Roger, Bernard, to U.S. Philips Corporation. Method of manufacturing vertical complementary bipolar transistors each with epitaxial base zones. 3,959,039, Cl. 148-175.000.

Boor, Elijah M. Muffler system. 3,958,660, Cl. 181-57.000.

Booth, Thomas A., to Addressograph Multigraph Corporation. Dynamic optical font availability system. 3,959,801, Cl. 354-7.000.

Boots Company Limited, The: *See*—
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Borchardt, Robert E.: *See*—
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Borkowski, Donald F., to Bendix Corporation, The. Hold-down device for a drum brake. 3,958,674, Cl. 188-340.000.

Bornstein, Joseph: *See*—
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Borrevik, Alexander J.; Cotton, Robert B., Jr.; and Mathias, Robert G., to Hammond Corporation. Musical instrument rhythm programmer having provision for automatic pattern variation. 3,958,483, Cl. 84-1.030.

Borzym, John J., to Alpha Industries, Inc. Method for making die jaw inserts for tube cutoff machines. 3,958,467, Cl. 76-107.00R.

Boschman, Theodorus Antonius Cornelis; and Korsloot, Jacob Gerard, to U.S. Philips Corporation. Quinoline derivatives having pharmacological effects. 3,959,473, Cl. 424-258.000.

Bose, Bimal K.; and Espelage, Paul M., to General Electric Corporation. Voltage control system for high frequency link cycloconverter. 3,959,720, Cl. 323-102.000.

Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, to Bayer Aktiengesellschaft. 1,4-Dihydropyridines. 3,959,296, Cl. 260-294.80G.

Bossert, Friedrich: *See*—
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Bosso, Joseph F.; and Wismer, Marco, to PPG Industries, Inc. Method of electrodepositing quaternary sulfonium group-containing resins. 3,959,106, Cl. 204-181.000.

Bouet, Jacques Eugene, to International Harvester Company. Cutter blade mounting for a rotary mower. 3,958,402, Cl. 56-295.000.

Bourrieres, Pierre, to Manufacture d'Appareillage Electrique de Cahors. Retaining device for an electric cable. 3,958,784, Cl. 248-63.000.

Bower, Kenneth W.; and Jones, Burl R., Sr., to Uarco Incorporated. Deleaver for continuous business forms assembly. 3,958,798, Cl. 270-52.500.

Bowers, William S., to United States of America, Agriculture. Synthetic hormones for insect control. 3,959,264, Cl. 260-240.00R.

Bowry, Anthony David; and Francis, Christopher, to Animatic Company Limited. Apparatus for controlling slide projectors. 3,958,875, Cl. 353-86.000.

Boyajian, Alfred Z. Drill guide. 3,958,893, Cl. 408-112.000.

Boyd, Donald R., to Allis-Chalmers Corporation. Overcurrent trip device. 3,959,667, Cl. 307-235.00T.

Boyd, James Lee, to Gerald D. Hines Interests. Modular construction system. 3,959,423, Cl. 264-34.000.

Bozinovich, Matthew J.: *See*—
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Bracey, Kenneth Edward George; and Petrie, James Alexander, to Rolls-Royce (1971) Limited. Shaft couplings. 3,958,887, Cl. 403-9.000.

Brack, Alfred; and Schmitt, Ernst, to Bayer Aktiengesellschaft. Cationic dyestuffs. 3,959,310, Cl. 260-326.900.

Brackenridge, David R., to Ethyl Corporation. Recovery of brominated biphenyl oxide. 3,959,387, Cl. 260-612.00R.

Brademann, Gerhard: *See*—
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Bradford, Robert C. Conveyor construction. 3,958,686, Cl. 198-189.000.

Bradley, Arthur, to Surface Activation Corporation. Method and apparatus for making laminates. 3,959,567, Cl. 428-461.000.

Brail, Fred. Bi-directional motor drive system. 3,959,699, Cl. 318-45.000.

Branigan, Patrick Mannix, to Institute For Industrial Research and Standards. Fluid pressure powered actuator. 3,958,368, Cl. 49-324.000.

Brantley, Lott W., Jr., to United States of America, National Aeronautics and Space Administration. Solar energy trap. 3,958,553, Cl. 126-270.000.

Braun Aktiengesellschaft: *See*—
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Braun, Anton. Non-friction pressure seal. 3,958,841, Cl. 308-3.500.

Braun, William A., to Honeywell Information Systems, Inc. System for increasing the number of data tracks in a magnetic recording system. 3,959,820, Cl. 360-77.000.

Bray, Donald T., to Desalination Systems, Inc. Reverse osmosis system with automatic flushing. 3,959,146, Cl. 210-257.00M.

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Brazhnikov, Evgeny Mikhailovich; Gerbich, Viktor Ivanovich; Krinsky, Igor Vladimirovich; Lisitsyn, Dmitry Mitrofanovich; Moskvin, Vladimir Fedorovich; Razumovsky, Stanislav Dmitrievich; Russian, Evgeny Kalikstovich; Truonikov, Gennady Romanovich; Chernykh, Vladimir Ivanovich; Shalomeev, Andrei Stepanovich; Chirkov, Nikolai Mikhailovich, deceased; and by Chirkov, Mikhail Nikolaevich, administrator. Analyzer for determination of double bonds. 3,958,942, Cl. 23-253.00R.

Breglia, Denis R.; and Rodemann, Alfred H., to United States of America, Navy. Holographic object recognition trainer. 3,958,860, Cl. 350-3.500.

Breiter, Manfred W., to General Electric Company. Cathode cell casing portion, a cell casing, and a hermetically sealed sodium-sulfur cell. 3,959,013, Cl. 136-6.0FS.

Brennan, Michael E.; and Yeakey, Ernest L., to Jefferson Chemical Company, Inc. Process for the preparation of mixed isomeric methylene-bridged polycyclohexylpolyamines. 3,959,374, Cl. 260-563.00B.

Bresnick, Herbert L.: *See—*
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Brette, Yves-Jean, to Compagnie Honeywell Bull (Societe Anonyme). Apparatus for transferring data from a volatile main memory to a store unit upon the occurrence of an electrical supply failure in a data processing system. 3,959,778, Cl. 340-172.500.

Breuer, Hermann, to E. R. Squibb & Sons, Inc. 1,2,4-Oxadiazolonylacetyl penicillins. 3,959,259, Cl. 260-239.100.

Bridwell, B. W.; and Johnson, Carl E., to Nalco Chemical Company. Mono-alkylation of naphthalene. 3,959,399, Cl. 260-671.00C.

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Agricola, Francis Oswald; Briner, William Watson; Granger, Robert James; and Widder, James Stone, 3,959,458.

Brinkmann, Jurgen; Trippe, Gerwin; and Heissman, Willi, to Varta Batterie Aktiengesellschaft. Plate grid for lead storage batteries. 3,959,015, Cl. 136-37.000.

Brisson, Leonard L. Pump with shearing means. 3,958,895, Cl. 415-121.00B.

Bristol-Myers Company: *See—*
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Britch, James A.; and Smith, John R., to Standard Oil Company (Indiana). Flapper-type subsurface safety valve. 3,958,633, Cl. 166-117.500.

British Coal Utilization Research Association Limited, The: *See—*
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British Leyland Motor Corporation Limited: *See—*
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British Secretary of State for Defence: *See—*
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Broecker, Bernhard; and Schardt, Richard, to Hoechst Aktiengesellschaft. Process for the manufacture of heat-curable synthetic resins which can be diluted with water and are suitable for the electrophoretic coating process. 3,959,198, Cl. 260-23.70A.

Bronovsky, Grigory Abramovich: *See—*
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Brooker, Gary, to University of Southern California, The. Enzyme preparation for serum cardiac glycoside assay. 3,959,077, Cl. 195-63.000.

Brow, George F. Pie board. 3,958,797, Cl. 269-302.100.

Brown, Asa Elliott. Barrel ball game. 3,958,806, Cl. 273-85.00C.

Brown, Bert O.: *See—*
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Brown, Cicero C., deceased; and by Brown, Joe R., executor. Movable track assembly for drive tracks. 3,958,836, Cl. 305-14.000.

Brown, Coy B. Safety assembly for dump beds. 3,958,829, Cl. 298-23.00B.

Brown, Joe R., executor: *See—*
Brown, Cicero C., deceased; and Brown, Joe R., executor, 3,958,836.

Brown, Richard L.; and Nohrenberg, Warren R. Leveling and upwardly elevating apparatus for reinforced perforate tags. 3,958,697, Cl. 211-54.000.

Brown, Silas A., to Buckbee-Mears Company. Manifold for fluid distribution and removal. 3,958,587, Cl. 138-198.000.

Brown, Victor R.: *See—*
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Brownell, Lloyd E.; and Isaacson, Raymond E., to United States of America, Energy Research and Development Administration. Process for encapsulating radionuclides. 3,959,172, Cl. 252-301.10W.

Brozzo, Pietro: *See—*
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Brugger, Wilhelm, to Th. Goldschmidt AG. Process for the preparation of carbonated hydrated zirconium oxide. 3,959,447, Cl. 423-419.000.

Bruker-Physik AG: *See—*
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Brummer, Wolfgang: *See—*
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Brunetti, Heimo: *See—*
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Schwarzenbach, Kurt; Gilg, Bernard; Brunetti, Heimo; and Muller, Helmut, 3,959,413.

Bruno, Edward C. Slitted packaging apparatus. 3,958,751, Cl. 229-87.00F.

Bruun, Henrik; and Savikko, Heikki. Method for manufacturing wood material boards. 3,959,005, Cl. 106-163.00R.

Bryant Grinder Corporation: *See—*
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Brzezinski, Alex Michael; and Warren, Joe Edward, to Bell Telephone Laboratories, Incorporated. Tensioned diaphragm mounting for an electroacoustic transducer. 3,958,662, Cl. 181-171.000.

Bucalo, Louis, to Microbyx Corporation. Methods and devices for collecting body fluids. 3,958,561, Cl. 128-2.00F.

Buchan, William A.: *See—*
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Buchman, Michael A.; and Reinhard, Neil A., to Dicken Manufacturing Company. Well pipe connector. 3,958,632, Cl. 166-85.000.

Buckbee-Mears Company: *See—*
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Buckley, Charles G., to Sperry Rand Corporation. Means for inhibiting the formation of friction polymers on brush and slip ring assemblies. 3,959,679, Cl. 310-232.000.

Buckman Laboratories, Inc.: *See—*
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Buckman, Stanley J.; Fenyes, Joseph G. E.; and Pera, John D., to Buckman Laboratories, Inc. Halogenated propyl esters of cyanodithioimidocarbonic acid. 3,959,328, Cl. 260-453.0RW.

Budd Company, The: *See—*
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Budinger, Bruce O.: *See—*
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Builder, Stuart Elliot: *See—*
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Bull, George H.; Bull, Paul D.; and Cunningham, James E., to Bull, George H.; and Cunningham, James E., part interest to each. Methods and mechanisms for drilling transversely in a well. 3,958,649, Cl. 175-61.000.

Bull, Paul D.: *See—*
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Bullara, Leo A.: *See—*
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Bunn, Dorrance Parks, Jr.; and Strickland, John Curtis, to Texaco Inc. Fluid catalytic cracking of hydrocarbons. 3,959,117, Cl. 208-113.000.

Burgess, Kenneth G., to Hydrospace Industries, Inc. Apparatus for silver recovery. 3,959,110, Cl. 204-229.000.

Burkholder, Nelson D., Jr., to Dow Chemical Company, The. Preparation of water-absorbent articles. 3,959,569, Cl. 428-475.000.

Burmeister, Harland R., to United States of America, Agriculture. Antibiotic equisetin and method of production. 3,959,468, Cl. 424-122.000.

Burnett, Leo S., to American Hoechst Corporation. Photosensitive diazo steel lithoplate structure. 3,958,994, Cl. 96-75.000.

Burnett, Richard T.: *See—*
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Burns, Bernard J.: *See—*
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Burroughs Corporation: *See—*
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Wood, Hamish Christopher Swan; Stuart, Alexander; Curran, Adrian Charles Ward; and Al-Hassan, Saieba, 3,959,278.

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Bush, Richard W.: *See—*
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Bushick, Ronald D.; and Angstadt, Howard P., to Sun Ventures, Inc. Ammoxidation process. 3,959,336, Cl. 260-465.00C.

Bushick, Ronald D.; and Angstadt, Howard P., to Sun Ventures, Inc. Ammoxidation process. 3,959,337, Cl. 260-465.00C.

Bussmann, Egon; and Pritzl, Walter, to Siemens Aktiengesellschaft. Process for the automatic checking and control of etching machines. 3,959,046, Cl. 156-7.000.

Butler, Farrell G., Jr. Gasoline mileage indicator system. 3,958,453, Cl. 73-114.000.

Butter, Stephen A.; and Murray, James G., to Mobil Oil Corporation. Use of nickel cyclooctadiene as a hydrogenation catalyst. 3,959,239, Cl. 526-25.000.

C.A.V. Limited: *See—*
Walker, Michael Edward; and Wooding, Peter Timothy, 3,959,672.

Cain, Earl S.; Carlson, Jerome A.; and Goodrich, George E., to Tribotech. Bearing assembly. 3,958,847, Cl. 308-196.000.

Caldwell, Robert A. Stopper plug for bottom pour ladles. 3,958,730, Cl. 222-559.000.

California Institute of Technology: *See—*
Mead, Carver, 3,959,774.

Callender, George R., Jr. Derotation brace for tibia deformities. 3,958,567, Cl. 128-80.00R.

Calloue, Georges; and Hughes, Jean, to Octel-Kuhlmann. Preparation of pure bromine from aqueous hydrobromic acid solutions. 3,959,450, Cl. 423-507.000.
Calvert, John Richard: *See—*
Perkins, Roy Frederick; and Calvert, John Richard, 3,958,534.
Campbell, Gerald A.; Cohen, Hyman; and Hamilton, Lewis R., to Eastman Kodak Company. Photographic elements containing cross-linked mordants and processes of preparing said elements. 3,958,995, Cl. 96-84.00A.
Campbell, Peter John: *See—*
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Campener Torzo, Ferruccio, to Montefibre S.p.A. Cop made of plastic material. 3,958,776, Cl. 242-118.320.
Camper, William John, to Hobart Corporation. Sharpener for commodity slicing machine. 3,958,478, Cl. 83-174.000.
Canevari, Gerard P., to Exxon Research and Engineering Company. Oil collection agents and their use in containing oil slicks. 3,959,134, Cl. 210-59.000.
Cannalonga, Marco Alfred; and Czarecki, Louis Vincent, to Hoffmann-La Roche Inc. Free-flowing, high density, agglomerated riboflavin powders. 3,959,472, Cl. 424-252.000.
Cannan, Bernard M., to Servicemaster Industries Inc. Cleaning nozzle. 3,958,298, Cl. 15-322.000.
Canney, Robert S.: *See—*
Ouellette, Ronald J.; Canney, Robert S.; and Stetson, Ralph B., 3,959,760.
Canning, Bernard, to Dresser Industries, Inc. Automatic controller for electrostatic precipitator. 3,959,715, Cl. 323-19.000.
Cantley, George A.; and Litzell, John E., to Incom International, Inc. Station control selection system. 3,958,524, Cl. 114-146.000.
Cantone, Natale. Agricultural machine for tilling the soil. 3,958,520, Cl. 111-6.000.
Capek, William J., to Sun Electric Corporation. Distributor voltage sensor. 3,959,725, Cl. 324-16.00S.
Capelli, John J., to Lawrence Peska Associates, Inc., a part interest. Partitioned ventilated clothes hamper. 3,958,715, Cl. 220-22.000.
Capelli, Raymond A. Positive displacement device. 3,958,903, Cl. 417-503.000.
Caplan, Harry W. Lightweight reflective panels for solar-thermal power plants and methods of forming such panels. 3,959,056, Cl. 156-197.000.
Carborundum Company, The: *See—*
Carpenter, James H., Jr.; and Ixer, Bernard W., 3,958,764.
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Cooper, Julius; Ensmann, Burt; Nielsen, Edwin; and Carella, Vincent, 3,958,361.
Carey, Steve J., to Harnischfeger Corporation. Positive safety locking system for powered outrigger beams. 3,958,813, Cl. 280-755.000.
Carlson, Arthur A. Canoe storage compartment. 3,958,289, Cl. 9-1.700.
Carlson, Elmer A., to International Telephone and Telegraph Corporation. Ignition system and components thereof. 3,958,791, Cl. 251-129.000.
Carlson, Jerome A.: *See—*
Cain, Earl S.; Carlson, Jerome A.; and Goodrich, George E., 3,958,847.
Carlson, Richard L. Flat stock cutter. 3,958,477, Cl. 83-167.000.
Carmassi, Michel; Louvel, Bernard; and Vandesande, Georges, to Societe Nationale des Petroles d'Aquitaine. Process to purify gas containing hydrogen sulphide by means of amines. 3,958,943, Cl. 23-255.00R.
Carmichael-Drage, John: *See—*
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Carpenter, Eugene C., to Outboard Marine Corporation. Grass collection apparatus. 3,958,401, Cl. 56-202.000.
Carpenter, James H., Jr.; and Ixer, Bernard W., to Carborundum Company, The. Granulating apparatus. 3,958,764, Cl. 241-74.000.
Carroll, Thomas D., to Memorex Corporation. Switch actuator rocker handle. 3,959,618, Cl. 200-339.000.
Casio Computer Co., Ltd.: *See—*
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Catterson, Robert K.; and Mitchell, Robert K., to Briggs & Stratton Corporation. Rotary engine with modified trochoidally shaped inner wall. 3,958,906, Cl. 418-61.00A.
Caulton, John Edward: *See—*
Weaving, John Harold; Haynes, Cecil David; and Caulton, John Edward, 3,958,312.
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Celanese Corporation: *See—*
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Centre Technique de l'Industrie des Papiers Cartons et Celluloses: *See—*
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Centro Sperimentale Metallurgico S.p.A.: *See—*
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Ceskoslovenska akademie ved: *See—*
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Chalov, Vladimir Pavlovich: *See—*
Kabanov, Nikolai Pavlovich; Schukin, Vitaly Sergeevich; Suvorov, Vladimir Nikolaevich; Savonichev, Dmitry Nikolaevich; Shepelev, Dmitry Nikolaevich; and Chalov, Vladimir Pavlovich, 3,958,472.
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Chana, Maghar S.; Kraley, Ramond L.; Hauptmann, Eric A.; and Pressman, Barry M., to Rochester Instrument Systems, Inc. Electronic wattmeter. 3,959,724, Cl. 324-142.000.
Chana, Maghar S.; and Hauptmann, Eric A., to Rochester Instrument Systems, Inc. Isolated two-wire transmitter. 3,959,786, Cl. 340-210.000.
Chandan, Harish: *See—*
DeJonghe, Lutgard C.; and Chandan, Harish, 3,959,022.
Chang, Eugene Yue Chieh; and Li, Tsi Tieh, to American Cyanamid Company. Polyformals having low methylol end-group content and polyurethanes produced therefrom. 3,959,227, Cl. 260-67.0TN.
Chang, Wen-Hsuan, to PPG Industries, Inc. High solids, water thinnable compositions. 3,959,201, Cl. 260-29.40R.
Chappell, George D.: *See—*
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Chelminski, Stephen V., to Bolt Associates, Inc. Powerful submersible deepwater pile driver powered by pressurized gas discharge. 3,958,647, Cl. 173-127.000.
Chemed Corporation: *See—*
Hwa, Chih Ming; Cuisia, Dionisio Guerrero; and Salutsky, Murrell Leon, 3,959,167.
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Cheung, Nelson, to Signode Corporation. Load anchor means. 3,958,516, Cl. 105-478.000.
Chevron Research Company: *See—*
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Peeler, Robert L.; and King, John M., 3,958,624.
Woo, Gar Lok, 3,959,334.
Chia, E. Henry; Powers, Frank M.; and Chadwick, Kenneth E., to Southwire Company. Aluminum iron cobalt silicon alloy and method of preparation thereof. 3,958,987, Cl. 75-148.000.
Chia, Henry E.: *See—*
Forberg, Helge O.; Chia, Henry E.; and Keith, Paul S., 3,958,981.
Chiba Carbon Research Corporation, The: *See—*
Hayashi, Kiyoshige; Nakaniwa, Mikio; Yamamoto, Minoru; Ozaki, Kazuo; and Baba, Arimasa, 3,959,115.
Child, Roy Edward. Turning. 3,958,809, Cl. 279-1.00L.
Chipp, Douglas Frank; and Delorme, Raymond. Tamperproof containers. 3,958,747, Cl. 229-43.000.
Chirkov, Mikhail Nikolaevich, administrator: *See—*
Brazhnikov, Evgeny Mikhailovich; Gerbich, Viktor Ivanovich; Krinsky, Igor Vladimirovich; Lisitsyn, Dmitry Mitrofanovich; Moskvin, Vladimir Fedorovich; Razumovsky, Stanislav Dmi-

trievich; Russian, Evgeny Kalikstovich; Truonikov, Gennady Romanovich; Chernykh, Vladimir Ivanovich; Shalomeev, Andrei Stepanovich; Chirkov, Nikolai Mikhailovich, deceased; and Chirkov, Mikhail Nikolaevich, administrator, 3,958,942.

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Chisholm, Douglas S.: *See*—
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Chocol, Clifford J.; and Polhemus, Carl E., to Martin Marietta Corporation. Directly viewable stereoscopic projection system. 3,959,580, Cl. 178-6.500.

Chou, Eddie C.: *See*—
Queneau, Paul B.; Symens, Raymond D.; and Chou, Eddie C., 3,959,097.

Chrepta, Metro M.; and Jacobs, Harold, to United States of America, Army. Semiconductor waveguide antenna with diode control for scanning. 3,959,794, Cl. 343-701.000.

Christie, Charles Dewey: *See*—
Wicker, Charles David; Tucher, Donald Louis; and Christie, Charles Dewey, 3,958,739.

Christie, Joe William. Apparatus for connecting a main to a plurality of sizes of service lines. 3,958,593, Cl. 137-318.000.

Chromalloy-Alcon Inc.: *See*—
Schultz, Ronald L.; and Linkowski, Stanley A., 3,958,857.

Chubachi, Susumu: *See*—
Yusa, Haruhiko; Hashizume, Hideyuki; Oota, Masanori; Takahashi, Kazuo; and Chubachi, Susumu, 3,959,408.

Ciba-Geigy AG: *See*—
Berger, Alfred; and Abel, Heinz, 3,958,931.
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Graff, Gustaf; Angliker, Hans-Jorg; Peter, Richard; Milicevic, Branimir; Hoster, Hansruedi; and Defago, Raymond, 3,958,933.
Moser, Paul; and Rody, Jean, 3,959,326.
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Cincinnati Milacron Chemicals, Inc.: *See*—
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Cincinnati Milacron, Inc.: *See*—
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McDonald, David Ian; Sederberg, George William; Stephenson, Gary David; and Wiatt, James Gordon, 3,958,685.

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Cities Service Company: *See*—
Warner, Amos C.; and Williams, Chalmes V., 3,959,008.

Claesson, Knut Hjalmar, to Nordisk Kartro Aktiebolag. Machine for cutting material. 3,958,482, Cl. 83-559.000.

Clairol Incorporated: *See*—
Bil, Milos S., 3,959,377.

Clark, James L.: *See*—
Rath, Lucien M.; and Clark, James L., 3,959,058.

Clark, Victor Malcolm; Gregory, Gordon Ian; and Webb, Godfrey Basil, to Glaxo Laboratories Limited. Preparation of 2-aryl-2-hydroxyiminoacetic acids (syn isomers). 3,959,314, Cl. 260-332.20A.

Clarke, David E., to Texas Instruments Incorporated. Motor protector. 3,959,691, Cl. 317-13.00B.

Clasen, Helmut; and Deneke, Klaus, to Dynamit Nobel Aktiengesellschaft. Method of preparing an electrically insulating embedding composition. 3,959,001, Cl. 106-60.000.

Clausen, Carol W. Helmet. 3,958,276, Cl. 2-2.500.

Cleer, Clarence W., Jr., to Ridgway Steel Fabricators, Inc. Hydrothermo fireplace and heating system therefor. 3,958,755, Cl. 237-8.00R.

Clements, Joseph A.: *See*—
Willis, Wilburn C.; Denhart, William L.; Kelly, Frank M.; and Clements, Joseph A., 3,958,448.

Clingan, Andrew J. Enclosed minnow dipper with automatic access door. 3,958,356, Cl. 43-4.000.

Coal Industry (Patents) Limited: *See*—
Fuller, Robert John; Ladner, William Redvers; and Pritchard, Ernest, 3,959,448.

Cobbs, James H., to United States of America, Interior. Technique for lining shaft. 3,958,637, Cl. 166-287.000.

Cobbs, James H.; and Morrell, Roger J., to United States of America, Interior. Drilling system using weight of mud. 3,958,650, Cl. 175-205.000.

Coca-Cola Co., The: *See*—
Takino, Yoshinori, 3,959,497.

Cohen, Ernest; Huberman, Marshall N.; Krieve, Walter F.; and Lear, Charles W., to TRW Inc. Method of removing particles and fluids from a gas stream by charged droplets. 3,958,959, Cl. 55-10.000.

Cohen, Hyman: *See*—
Campbell, Gerald A.; Cohen, Hyman; and Hamilton, Lewis R., 3,958,995.

Cohn, Ruth, to A.P.V. Company Limited, The. Concentration of volatiles-bearing products. 3,959,067, Cl. 159-17.00R.

Coleman, Lester E., to Lubrizol Corporation, The. Nitrogen-containing mixed esters and lubricants. 3,959,159, Cl. 252-51.50A.

Coleman, Lester Earl, to Lubrizol Corporation, The. Water-soluble hydroxyalkylated and alkoxyalkylated compositions and the like derived from N-3-oxohydrocarbon-substituted acrylamides, and polymers thereof. 3,959,224, Cl. 260-63.00R.

Coleman, Richard R., Jr.; and Weber, Helmut E., to General Power Corporation. Staged expansion system as employed with an integral turbo-compressor wave engine. 3,958,899, Cl. 417-64.000.

Coley, Kenneth R.; and Misencik, John J., to Westinghouse Electric Corporation. Ground fault interrupter apparatus with means protecting against a grounded neutral condition. 3,959,693, Cl. 317-18.00D.

Colgate-Palmolive Company: *See*—
Farley, George Thomas, 3,959,163.
Inamorato, Jack Thomas, 3,959,157.
Lajovic, Dusan S., 3,958,914.
Yurko, Joseph A., 3,959,165.

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Combustion Engineering, Inc.: *See*—
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Commissariat a l'Energie Atomique: *See*—
Barriere, Andre; and Rough, Pierre, 3,958,714.
Marine, Jean; and Rodot, Huguette, 3,959,026.

Communications Satellite Corporation: *See*—
Dunlop, James D.; Earl, Martin William; and Ommering, Gerrit Van, 3,959,018.

Compagnie des Services Dowell Schlumberger: *See*—
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Compagnie Honeywell Bull (Societe Anonyme): *See*—
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Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
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Merlet, Pierre; Vernezy, Jacques; and Barigot, Jean-Claude, 3,959,606.

Compagnie Internationale pour l'Informatique: *See*—
Fressineau, Jean-Louis; Hubert, Maurice; and Hoffmann, Pierre, 3,959,783.

Connolly, Daniel M. Variable pitch propeller. 3,958,897, Cl. 416-166.000.

Console, Luciano; Zecchin, Alessandro; and Quarta, Antonio, to Societe' Italiana Resine S.I.R. S.p.A. Catalytic process for the preparation of polyacrylonitrile and acrylonitrile copolymers. 3,959,240, Cl. 526-341.000.

Conti, Fulvio. Motorized expander for one, two or more cloth width. 3,958,309, Cl. 26-105.000.

Continental Can Company, Inc.: *See*—
Kowalik, John J.; and Hasegawa, Gary K., 3,958,718.

Continental Oil Company: *See*—
Groves, William L., Jr., 3,959,323.

Contreras, Amelia. Language instruction device. 3,958,345, Cl. 35-35.00H.

Conway, Edward F., to Magnaflux Corporation. Method for the removal of penetrant. 3,958,940, Cl. 23-230.00L.

Cook, Barry, to Ciba-Geigy Corporation. Piperidine derivatives. 3,959,291, Cl. 260-293.660.

Cooke, Charles M.: *See*—
Mazdiyasni, Khodabakhsh S.; and Cooke, Charles M., 3,959,446.

Cooley, Denton A.: *See*—
Sharp, Russell G.; Cooley, Denton A.; and Reed, Charles C., 3,958,557.

Coombs, Robert V.; and Houlihan, William J., to Sandoz, Inc. Substituted naphtho pyrazoles. 3,959,308, Cl. 260-310.00R.

Coone, Malcolm G., to Lynes, Inc. Quick latching drill pipe blowout preventer and method of use thereof. 3,958,642, Cl. 166-315.000.

Cooper, Adrianus A. G., to Babcock & Wilcox Company, The. Racket yoke. 3,958,805, Cl. 273-73.00G.

Cooper, Glenn D.; and Abolins, Visvaldis, to General Electric Company. Blends of a polyphenylene ether resin and alkenyl aromatic resins modified with EPDM rubber. 3,959,211, Cl. 260-42.180.

Cooper, Julius; Ensmann, Burt; Nielsen, Edwin; and Carella, Vincent, to Ideal Toy Corporation. Track segment with braking elements which retain vehicle vertically during braking. 3,958,361, Cl. 46-1.00K.

Copeland, Leigh D.; and Morrison, Howard J., to Marvin Glass & Associates. Doll and wheeled vehicle. 3,958,363, Cl. 46-106.000.

Coppola, Richard: *See*—
Sentementes, Thomas J.; Castello, Eugene A.; and Coppola, Richard, 3,959,525.

Corbiere, Claude, to Rhone-Poulenc-Textile. Yarn having a basis of polyester with irregular titer. 3,958,406, Cl. 57-140.00J.

Corcoran, Neal A., Jr.: *See*—
McCartan, Daniel A.; and Corcoran, Neal A., Jr., 3,959,572.

Cornelius, Walter; and Fredriksen, Hans P., to General Motors Corporation. Combustion method and apparatus. 3,958,413, Cl. 60-39.060.

Cornell Research Foundation, Inc.: *See*—
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Corning Glass Works: *See*—
Lawhead, Creighton M., 3,958,572.

Correa, Ronald J. Protective cushion for gymnastic equipment. 3,958,801, Cl. 272-63.000.

Corry, John: *See*—
Liebman, Israel; Corry, John; and Richmond, J. Kenneth, 3,958,644.

Cory Food Services, Inc.: *See*—
Vitous, Charles J., 3,958,502.

Cosan Chemical Corporation: *See*—
Luloff, Jerome S.; and Eilender, Albert L., 3,959,276.

Cosden Oil & Chemical Company: *See*—
Wiley, Donald F., 3,959,432.

Cotton, Boyce Y., to Cotton, Horace P. Liquid lifting and storage apparatus and method. 3,958,424, Cl. 61-10.000.

Cotton, Horace P.: *See*—
Cotton, Boyce Y., 3,958,424.

Cotton, Robert B., Jr.: *See*—
Borrevik, Alexander J.; Cotton, Robert B., Jr.; and Mathias, Robert G., 3,958,483.

Coulston, Frederick; and Rosenblum, Ira, to Istituto Chemioterapico Italiano. Method for reducing serum blood cholesterol. 3,959,492, Cl. 424-324.000.

Coulter Electronics, Inc.: *See*—
Jones, Alan Richardson, 3,958,939.

Coussediere, Daniel: *See*—
Chazan, Jean-Bernard; Coussediere, Daniel; and Gasc, Jean-Claude, 3,959,255.

Cox, Robert Powers. Method and composition for retarding the evaporation of ammonia and amines. 3,959,154, Cl. 252-1.000.

Cox, William L., to Goodyear Tire & Rubber Company, The. Latex viscosity depressants. 3,959,207, Cl. 260-29.70E.

Crabb, Robert P.: *See*—
Gilbreath, Jim A.; Crabb, Robert P.; and Unger, Robert A., 3,959,665.

Craig, Robert Lyle: *See*—
Roberts, James Stewart; and Craig, Robert Lyle, 3,959,214.

Creighton, Stephen M., to Hooker Chemicals & Plastics Corporation. Esters of hydroxyaryl adducts of decachloropentacyclo ($5.3.0.0^{2,6}.0^{4,10}0^{5,9}$) decane-3-one. 3,959,353, Cl. 260-479.00R.

Crews, Roy E.; and Legg, Eugene D., to Westinghouse Electric Corporation. Lifting frame and methods of lifting prefabricated building modules. 3,958,824, Cl. 294-67.0DA.

Cripe, Maxwell L.: *See*—
Gardner, Delbert J.; and Cripe, Maxwell L., 3,958,497.

Crosa, Valentin L., to H. K. Porter Co. Fastener applying tool. 3,958,318, Cl. 29-267.000.

Crowder, Delphin F. Poultry conveyor means. 3,958,536, Cl. 119-82.000.

Crowe-Gulde, Inc.: *See*—
Salts, Thomas R., 3,958,506.

Crowe, Wylie W. Portable seat lift for use in bathtubs. 3,958,282, Cl. 4-185.00L.

Crown Zellerbach Corporation: *See*—
Pounds, Robert M., 3,958,736.

Cryder, John H.: *See*—
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Curington, Alfred R., to Bakerdrill, Inc. Bore hole air hammer. 3,958,645, Cl. 173-17.000.

Curless, Richard Anderson, to Cincinnati Milacron, Inc. Electrically compensated electrohydraulic servo system with position related feedback loop. 3,958,492, Cl. 91-363.00R.

Curran, Adrian Charles Ward: *See*—
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Dahlbom, Johan Richard; Karlen, Bo Lennart; and Lindgren, Sune Gunnar, to Aktiebolaget Astra. Oxotremorine antagonists. 3,959,311, Cl. 260-326.5FL.

Dahle, Norman A., to Gulf Research & Development Company. Algicidol 2-chloro-5-tolyl-1,3,4-thiadiazoles. 3,959,301, Cl. 260-302.00D.

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D'Alessandro, Salvatore, deceased; by D'Alessandro, Francesco Carlo, heir; by D'Alessandro, Annunziata, heir; and by D'Alessandro, Sandro, heir. Edible hyperproteinic dietetic paste of high biological value. 3,959,512, Cl. 426-557.000.

D'Alessandro, Sandro, heir: *See*—
D'Alessandro, Salvatore, deceased; D'Alessandro, Francesco Carlo, heir; D'Alessandro, Annunziata, heir; and D'Alessandro, Sandro, heir, 3,959,512.

Dall'Asta, Leone, to Societe Anonyme dite: CLIN-MIDY. Process for the conversion of penicillin S-oxide into a corresponding desatoxycephalosporin. 3,959,266, Cl. 260-243.00C.

Dallen, John A., to Standard Products Company, The. Glazing system. 3,958,383, Cl. 52-400.000.

Dammel, Wilfried; and Diessel, Gunter, to Feinmechanische Werke Mainz GmbH. Apparatus for adjustably positioning an air-cooled device. 3,959,644, Cl. 240-47.000.

Daniel, Arlie H. Method of drilling an oil well to recover casings. 3,958,639, Cl. 166-294.000.

Daniels, Arlie H. Method of drilling an oil well to recover casings. 3,958,640, Cl. 166-315.000.

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D'Aquin, Esler L. Chemical treatment to soften the bones of small fish for edible purposes. 3,959,507, Cl. 426-643.000.

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Davis, Charles A.; Gallaro, Anthony V.; and Neuber, Ralph E., to GTE Sylvania Incorporated. Cathode ray tube construction having defined processing and operational means incorporated therein. 3,959,686, Cl. 313-450.000.

Davis, Robert A.; von Schmeling, Bogislay; Felauer, Ethel E.; and Kulka, Marshall, to Uniroyal. Method of protecting plants from fungal diseases using furan-3-carboxamide derivatives. 3,959,481, Cl. 424-285.000.

Davis, Walter Richard; and Henry, Tim Warren, to Motorola, Inc. Solid state current limit circuit. 3,959,713, Cl. 323-9.000.

Dawans, Francois; Goldenberg, Emmanuel; and Durand, Jean-Pierre, to Institut Francais du Petrole, des Carburants et Lubrifiants. Lubricating oil compositions containing hydrogenated polybutadiene viscosity index improvers. 3,959,161, Cl. 252-59.000.

Dawson, David H.; and Chisholm, Douglas S., to Dow Chemical Company, The. Method for the preparation of plastic lined pipe. 3,959,424, Cl. 264-88.000.

Day, Ian Harold; and Carmichael-Drage, John, to Polymark Corporation. Heat-sealable marking labels. 3,959,555, Cl. 428-349.000.

Day, Richard A.; and Gohil, Rasikkumar N., to Research Corporation. Haloalkylbenzoyl esters of di-lower alkylamino alkanols and quaternary lower alkyl salts thereof. 3,959,351, Cl. 260-477.000.

De La Moneda, Francisco H., to International Business Machines Corporation. Three mask self aligned IGFET fabrication process. 3,958,323, Cl. 29-571.000.

DeBaun, Jack R.; Pallos, Ferenc M.; and Teach, Eugene G., to Stauffer Chemical Company. N,N-dimethyl-N'-phenylthiocarbamyl formamidine and its use as an anti-inflammatory agent. 3,959,368, Cl. 260-552.0SC.

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De Graff, Richard R., to Universal Oil Products Company. Fractionation apparatus having two integral and concentric fractionating units. 3,959,085, Cl. 202-154.000.

de Heij, Nicolaas A.; and Hendrickx, Andreas J. J., to Andeno B.V. Preparation of phloroglucinol or its monomethyl ether. 3,959,388, Cl. 260-613.00D.

Deigner, Paul: *See—*
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Diamond, Julius; Douglas, George H.; and Burns, Bernard J., to William H. Rorer, Inc. 1-Substituted biguanides for treating hyperacidity or ulceration. 3,959,488, Cl. 424-326.000.

Dicken Manufacturing Company: *See—*
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Dieterich, Dieter: *See—*
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Dokunikhin, Nikolai Stepanovich; and Vorozhtsov, Georgy Nikolaevich. Imides of 1,1′-dinaphthyl-4,4′,5,5′,8,8′-hexacarboxylic acid. 3,959,285, Cl. 260-281.0NH.

Donahoo, Joe T., to General Electric Company. Concentrated winding salient-pole shaded pole motors having multiple short circuited shading coils for each pole. 3,959,678, Cl. 310-172.000.

Donald, Dennis Scott, to Du Pont de Nemours, E. I., and Company. Diimidazopyrazines and tetracarboxamidopyrazines. 3,959,277, Cl. 260-250.0BC.

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Dunn, Bobby Eugene, to B.F. Goodrich Company, The. Process for low ammonia operation of the nitrile synthesis. 3,959,341, Cl. 260-465.300.
Dunn, Edwin Reed, to Polysar Limited. Latex stability by addition of fluoride salts. 3,959,204, Cl. 260-29.7PT.
Dunn, William C., to Semi, Inc. MOS circuit recovery time. 3,959,782, Cl. 340-173.0CA.
Dunphy, Roderick R.; Bullara, Leo A.; and Pudenz, Robert H., to Huntington Institute of Applied Medical Research. Implantable pressure transducer. 3,958,558, Cl. 128-2.00P.
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Eriksson, Erik Gustav Lennart, to AB Karlstadplattan. Fractionated sawdust chipboard and method of making same. 3,959,195, Cl. 260-17.300.

Eriksson, Hans Erik; and Florvall, Gosta Lennart, to Astra Lakemedel Aktiebolag. Antihypertensive substituted triazoles. 3,959,476, Cl. 424-269.000.

Erlenbusch, Gary L.; and Mott, Richard H., to Du-Al Manufacturing Company. Automatic gate for a bale accumulator. 3,958,823, Cl. 292-226.000.

Erwin, Elmer: *See—*
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Espenscheid, Wilton F.; and Yan, Tsoung-Yuan, to Mobil Oil Corporation. Process for removing hydrogen sulfide from contaminated gas. 3,959,452, Cl. 423-573.00G.

Espenschied, Helmut, to Robert Bosch G.m.b.H. Electro-hydraulic gear shifting control for vehicle gears. 3,958,466, Cl. 74-867.000.

Esper, Friedrich J., to Robert Bosch G.m.b.H. Method of manufacturing white furnace boats for firing ceramic articles and novel furnace boats. 3,959,002, Cl. 106-65.000.

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Essilor International (Compagnie Generale d'Optique S.A.): *See—*
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Everett, Woodrow W.; and Adams, Edward M. Fishing reel. 3,958,771, Cl. 242-84.50R.

Evers, William John; Vock, Manfred Hugo; and Pelse, Igor Alexander, to International Flavors & Fragrances Inc. Flavoring foodstuffs using sulfur-containing compounds. 3,959,509, Cl. 426-535.000.

Ewe, Henning: *See—*
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Fairman, William. Overhead garage door spring safety device. 3,958,367, Cl. 49-197.000.

Faldi, Giovanni, to Pneuma International S.A. Multiple pumping chamber dredging apparatus. 3,958,346, Cl. 37-59.000.

Fales, John D., to Surface Activation Corporation. Electrode structure for generating electrical discharge plasma. 3,959,104, Cl. 204-164.000.

Farley, George Thomas, to Colgate-Palmolive Company. Stain removal. 3,959,163, Cl. 252-99.000.

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Federated Merchandisers, Inc.: *See—*
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Feibelman, Hans J., to A. & H. Mfg. Co. Display card holder assembly. 3,958,788, Cl. 248-214.000.

Feinbloom, Richard E., to Designs for Vision, Inc. Rotary switch assembly particularly adapted for use with fiber optic light sources. 3,959,612, Cl. 200-11.00R.

Feinmechanische Werke Mainz GmbH: *See—*
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Felix, Ernst; and Locher, Hans, to Zellweger, Ltd. Method of and an apparatus for uniformalizing combing machine slivers. 3,958,305, Cl. 19-215.000.

Fell, Albert J. Air filter cleaner. 3,958,296, Cl. 15-304.000.

Felton, Stephen M.; and Kapp, Ira B., to Kapp, Ira B. Beverage clouding agents based on natural gum resins. 3,959,510, Cl. 426-548.000.

Feneberg, Paul; and Krekeler, Ulrich, to AGFA-Gevaert, A.G. Process for the production of hydrophilic surfaces on silicon elastomer articles. 3,959,105, Cl. 204-165.000.

Fennekels, Peter; and Waltmann, Ernst, to Girmes-Werke AG, Firma. Relief printing acrylic pile fabric with di-beta-cyanoethyl formamide to simulate animal skins. 3,958,926, Cl. 8-15.000.

Fenyes, Joseph G. E.: *See—*
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Ferrari, Victor. Apparatus and method for moving roadway lane dividers. 3,958,890, Cl. 404-9.000.

Ferro Corporation: *See—*
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Fett, Darrell L.; and Bird, David A., to Honeywell Information Systems, Inc. Logic level translator. 3,959,666, Cl. 307-208.000.

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Findon, Harry L. Combination bait holder and fish hooking means. 3,958,355, Cl. 43-44.200.

Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C.: *See—*
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Finizio, Michael, to Endo Laboratories, Inc. Novel indolobenzazepine derivatives, useful as tranquilizers. 3,959,300, Cl. 260-296.00P.

Fink, Roger H.; and Porter, William D., to Akzona Incorporated. Apparatus and method for controlling the inventory of the yarn mass within a confined space. 3,958,734, Cl. 226-1.000.

Finlayson, Thomas J.; Grace, Michael H.; and Smith, George H., to Allis-Chalmers Corporation. Reel arrangement for electric wiring. 3,959,608, Cl. 191-12.20R.

Finnegan, John P.; and Gasparaitis, Bernard, to Motorola, Inc. Hermetically sealed keyboard type assembly with elastomeric electrical connecting link between switch and component modules. 3,959,610, Cl. 200-5.00A.

Firmin, Herman P. Fishing lure. 3,958,358, Cl. 43-42.510.

Fischer, Artur. Expansible anchor. 3,958,488, Cl. 85-77.000.

Fischer, Paul W.: *See—*
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Fischer & Porter Co.: *See—*
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Fisk, George H.; and Loulan, James A., Jr., to Goodyear Tire & Rubber Company, The. Surface treatment of tires to reduce flash. 3,959,053, Cl. 156-123.000.

Fleissner, Hans, to Vepa AG. Process and apparatus for the production of blends. 3,958,925, Cl. 8-14.000.

Florvall, Gosta Lennart: *See—*
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Forenade Fabriksverken: *See—*
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Johansson, Lennart J. I.; Lindqvist, Bjorn W.; and Wallberg, Eric V., 3,958,550.
Forsen, Harold K., to Jersey Nuclear-Avco Isotopes, Inc. Collection of ions in a plasma by magnetic field acceleration with selective polarization. 3,959,649, Cl. 250-299.000.
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Foster, Patricia L.: *See—*
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Fountain, Laurence R. Method of removing a brazing alloy from stainless steel. 3,958,984, Cl. 75-105.000.
Foy, Wilfred Francis; and Watson, Lewis Ainsley, to Simon-Carves Limited. Charging machines. 3,958,700, Cl. 214-35.00R.
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Frank, Harry: *See—*
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Franzl, Alois, to Varta Batterie Aktiengesellschaft. Production of galvanic primary cells. 3,958,612, Cl. 141-12.000.
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Freenor, Francis J., III, to Chevron Research Company. S,S-dialkyl-N-substituted phosphoroamidothioates. 3,959,271, Cl. 260-247.10B.
Frese, Albert; Baxmann, Fritz; Dittmann, Walter; and Dietrich, Johann, to Chemische Werke Huls Aktiengesellschaft. Process for the production of crystalline propene-ethene-butene-1 terpolymers. 3,959,409, Cl. 260-878.00B.
Fressineau, Jean-Louis; Hubert, Maurice; and Hoffmann, Pierre, to Compagnie Internationale pour l'Informatique. Control store unit addressing device. 3,959,783, Cl. 340-173.0BB.
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Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
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Frigitemp: *See—*
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Frink, Russell E., to Westinghouse Electric Corporation. Hermetic seals for insulating-casing structures. 3,959,577, Cl. 174-50.500.
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Froman, Griff W.; Sok, Brian A.; Martinez, Lenin F.; and Mullins, Albert R., to Inland Steel Company. Electrolytic method of producing one-side-only coated steel. 3,959,099, Cl. 204-146.000.
Frykhult, Rune Helmer; and Ek, Bo Knut, to AB Celleco. Cyclone separator assembly. 3,959,150, Cl. 210-512.00M.
Frymaster Corporation, The: *See—*
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Fuelling, William, Jr.; and Jespersen, Herbert A., to Outboard Marine Corporation. Starter interlock for self-propelled lawn mower. 3,958,398, Cl. 56-10.500.
Fugleberg, Sigmund Peder: *See—*
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Fuji Chemical Industry Co., Ltd.: *See—*
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Fukada, Kazuo: *See—*
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Gaddy, Jerry C. Standing table for paraplegics. 3,958,568, Cl. 128-80.00R.
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Gallaro, Anthony V.: *See—*
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Galow, Manfred; and Osterberg, Heinz, to Bergwerksverband GmbH; and Didier Engineering GmbH. Multi-inlet hopper arrangement for filling successive ones of a battery of furnace chambers. 3,959,086, Cl. 202-262.000.

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Gambino, Richard J.; Holtzberg, Frederic; Ruf, Ralph R.; and Welber, Benjamin, to International Business Machines Corporation. Information storage by laser beam initiated reactions. 3,959,799, Cl. 346-135.000.

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Garate, Julian. Transmission jack. 3,958,793, Cl. 254-10.00B.

Garceau, Harry A., to Webster Spring Co. Inc. Innerspring. 3,958,610, Cl. 140-3.0CA.

Garcia, Uville A. Operation counter for cable actuated mechanical clutches. 3,959,634, Cl. 235-92.0PD.

Gardner, Delbert J.; and Cripe, Maxwell L., to Bendix Corporation, The. Wall means for a servomotor. 3,958,497, Cl. 92-48.000.

Gardner, Frederick Philip: *See—*
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Garrard, Bruce. Flow regulator. 3,958,596, Cl. 137-504.000.

Garrett Corporation, The: *See—*
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Garshelis, Ivan J. Electromechanical transducer having circularly magnetized helically wound magnetostrictive rod. 3,959,751, Cl. 335-3.000.

Garson, Joseph, to Kux Manufacturing Company. Sign board for truck trailers, semi-trailers and shipping containers. 3,958,350, Cl. 40-129.00C.

Garzelloni, Thomas L., to A W & H Manufacturing Co., Inc. Accumulating conveyor. 3,958,684, Cl. 198-127.00R.

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Gautreaux, Marcelian F., to Ethyl Corporation. Fuel compositions and additive mixtures containing carboxymethoxy propanedioic acid esters for alleviation of exhaust gas catalyst plugging. 3,958,955, Cl. 44-68.000.

Gavlin, Gilbert; and Bengali, Abid Hashim, to Custom Organics, Inc. Process for the purification of N,N-dimethylacetamide. 3,959,371, Cl. 260-561.00R.

Gaylord, Norman G., to Dart Industries Inc. Hydroxy-terminated polymers of butadiene. 3,959,244, Cl. 526-84.000.

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Godijn, Willem, to Research Instituut Sesto B.V. Gas burner. 3,958,762, Cl. 239-552.000.
Godwin, Gurney L.; and Rippin, Donald R., to Westinghouse Electric Corporation. Starting control system for synchronous motors. 3,959,702, Cl. 318-181.000.
Goedde, Franz; and Hoeller, Heinz, to Eschweiler Bergwerks-Verein Aktiengesellschaft. Method and apparatus for quenching of heated bulk materials. 3,959,083, Cl. 201-39.000.
Goeke, Eberhard, to Krupp-Koppers GmbH. Methane production process and arrangement therefor. 3,958,956, Cl. 48-62.00R.
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Granquist, William T., to N L Industries, Inc. Hydrocarbon cracking with synthetic smectite compositions. 3,959,118, Cl. 208-120.000.
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Greenhalgh, Frank E., to Technology Development Corporation. Pulse width modulated power supplies. 3,959,711, Cl. 321-18.000.
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GrosJean, Jon Paul, to GTE Sylvania Incorporated. Loudspeaker protection circuit. 3,959,736, Cl. 330-207.00P.
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Gutierrez, William A.; and Wilson, Herbert L., to United States of America, Army. Electron emitter and method of fabrication. 3,959,038, Cl. 148-171.000.
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Happel, Robert; and Maier, Lothar, to Daimler-Benz Aktiengesellschaft. Injection valve. 3,958,757, Cl. 239-125.000.
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Hardtmann, Goetz E.; and Kathawala, Faizulla G., to Sandoz, Inc. 4,6-Diaryl-pyrimidin-2(1H)-ones as tranquilizers. 3,959,471, Cl. 424-251.000.
Hardtmann, Goetz E., to Sandoz, Inc. Phenoxy-4-isocyano-butan-2-ols. 3,959,483, Cl. 424-304.000.
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Hay, Peter M., to Sandoz, Inc. Fabric softener. 3,959,156, Cl. 252-8.800.

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Hayashi, Tsutomu, to Nafco Giken, Ltd. Electrostatic precipitator. 3,958,962, Cl. 55-148.000.

Hayashida, Yoshihiro; Haraikawa, Tetsuo; and Mitobe, Setsuo, to Tokico Ltd. Hydraulic brake booster. 3,958,423, Cl. 60-553.000.

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Heidecker, Robert F.; Johnson, Albin Kenneth; and Royer, Galen B., to Dynastor, Inc. Flexible disc receiver using a tray which is withdrawn from a cartridge. 3,959,823, Cl. 360-99.000.

Heien, Sigurd. Offshore harbor tank and installation. 3,958,426, Cl. 61-46.000.

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Heimansohn, Henry C., to Indiana University Foundation. Artificial teeth with locating lugs and method for using same. 3,958,333, Cl. 32-2.000.

Heimansohn, Henry C., to Indiana University Foundation. Resilient artificial denture tooth. 3,958,334, Cl. 32-2.000.

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Hickox, Charles C.; and McGregor, J. Donald, to Thiokol Corporation. Flexible bearing having reinforcements. 3,958,840, Cl. 308-2.00A.

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Kehr, Clifton L.; and Marans, Nelson S., to W. R. Grace & Co. Novel hydrophobic polyurethane foams. 3,959,191, Cl. 260-2.5AD.

Keil, Joseph W., to Dow Corning Corporation. Modified unsaturated polyester compositions. 3,959,203, Cl. 260-29.1SB.

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Kelly, Donald A. Rotary closed parallel cycle engine systems. 3,958,421, Cl. 60-517.000.

Kelly, Donald A. Rotary stirling cycle engine systems. 3,958,422, Cl. 60-525.000.

Kelly, Donald A. Square form permeable electrodes for pressure electrolysis process units. 3,959,113, Cl. 204-278.000.

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Kimoto, Masakazu; and Shimonishi, Isoo, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing modified synthetic fibers. 3,959,559, Cl. 428-394.000.

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Kirsgalvis, Richard D., to Filter Specialists, Inc. Filter having an interior liquid displacement means, apparatus and method. 3,959,137, Cl. 210-84.000.

Kitaj, Walter, to Owens-Illinois, Inc. Method of improving adhesion of rubbery copolymers to glass. 3,959,533, Cl. 427-386.000.

Kitamori, Yoshiaki, to Sekisui Kasciihn Kabushiki Kaisha. Process for producing polyethylene resin particles and foamable polyethylene resin particles. 3,959,189, Cl. 260-2.50B.

Kitterman, Bedford L., to Fritz W. Glitsch & Sons, Inc. Vapor-liquid contact method. 3,959,419, Cl. 261-98.000.

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Koethmann, Wolfgang, to Siemens Aktiengesellschaft. Calculating unit for serial multiplication including a shift register and change-over switching controlling the transmission of the multiplicand bits to form the product. 3,959,639, Cl. 235-164.000.
Kogure, Katsura; Koyama, Hiroyasu; and Nakagawa, Kunio, to Nisshin Flour Milling Co., Ltd. 2-Hydroxy-3(4-alkylphenyl)-3-butenoic acid ester and process for the production thereof. 3,959,349, Cl. 260-473.00A.
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LaGuardia, Lawrence, to United States of America, Army. Pulse amplitude modulator. 3,959,745, Cl. 332-11.00D.

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Laing, Nikolaus. Drive engine for motor car accessory units. 3,958,419, Cl. 60-397.000.

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Lake, Robert D., to Koppers Company, Inc. Curable solid polyester resins. 3,959,209, Cl. 260-40.00R.

Lala, Robert J., to Lever Brothers Company. Reduced-staining colorant system for liquid laundry detergents. 3,958,928, Cl. 8-25.000.

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Lange, Gerhard; and Peche, Gerhard, to Siemens Aktiengesellschaft. Over voltage arrester. 3,959,696, Cl. 317-62.000.

Langer, Stanley H. Electrochemical recovery of copper from alloy scrap. 3,959,096, Cl. 204-107.000.
Langguth, Arthur F., to United States of America, Navy. EKG contact. 3,958,564, Cl. 128-2.06E.
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LaRochelle, Ronald W., to General Electric Company. Process for making silarylenesilanediol, silarylenesiloxanediol and silarylenesiloxane-polydiorganosiloxane block copolymers. 3,959,403, Cl. 260-825.000.
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Larsen, Earl I.; and Krock, Richard H., to P. R. Mallory & Co., Inc. Liquid phase-sintered molybdenum base alloys having additives and shaping members made therefrom. 3,958,316, Cl. 29-182.000.
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Laub, Leonard J., to Zenith Radio Corporation. Self-compensating focus system for optical video playback device. 3,959,581, Cl. 178-6.60R.
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Law, Robert L.; and Catano, Paul S., to United States of America, Navy. Solid state electronically rotatable raster scan for television cameras. 3,959,582, Cl. 178-6.800.
Lawhead, Creighton M., to Corning Glass Works. Blood collecting and separating assembly stopper. 3,958,572, Cl. 128-272.000.
Lawler, Joseph A., to Blue M Electric Company. Temperature controlled oven. 3,958,552, Cl. 126-247.000.
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Le Count, David James; and Squire, Christopher John, to Imperial Chemical Industries Limited. Method for producing β-adrenergic blockage with alkanolamine derivatives. 3,959,486, Cl. 424-324.000.
Lee, Alan John Clive; and Ling, Robin Sydney Mackwood, to National Research Development Corporation. Endoprosthetic knee joint. 3,958,278, Cl. 3-1.911.
Lee, Bert. Double acting ratchet wrench with cam actuated oscillatory pawl. 3,958,470, Cl. 81-63.000.
Lee, Harold E., to Essex International, Inc. Method of making a transformer coil assembly. 3,958,328, Cl. 29-605.000.
Lee, John L., to Distillers Company (Yeast) Limited, The. Reconstitution of dry yeast in dough preparation. 3,959,495, Cl. 426-24.000.
Lee, Thomas R.; Schneider, Roger H.; and Wyatt, John L., to United States of America, Health, Education and Welfare. Fast charge digitizer and digital data acquisition system for measuring time varying radiation fields. 3,959,653, Cl. 250-374.000.
Lee, Yuan Ho. Feeding device for the rotary die head of an automatic high-speed cold heading machine. 3,958,290, Cl. 10-13.000.
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Legler, Ernst, to Robert Bosch G.m.b.H. Generation of a switching signal for the chroma keying of color video signals. 3,959,813, Cl. 358-22.000.
Legras, Bertrand Leon. Filter especially intended for filtering natural water for the irrigation of cultivated fields. 3,959,140, Cl. 210-107.000.
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Lemahieu, Raymond Gerard: *See—*
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Lesch, Karl; and Brademann, Gerhard, to Licentia Patent-Verwaltungs-G.m.b.H. Apparatus for winding wire coils for electrical machines. 3,958,611, Cl. 140-92.100.
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Lewis, Geoffrey Arthur, to Lucas Aerospace Limited. Fuel control system for gas turbine engine. 3,958,415, Cl. 60-39.28R.
Lewis, George E.; and Murman, Fernando, to Hydril Company. Controlled closing pattern packing unit for blowout preventer. 3,958,808, Cl. 277-1.000.
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Liebowitz, Bernard, to Dorr-Oliver Incorporated. Continuously operating sedimentation tank with pier supported rake structure. 3,959,151, Cl. 210-528.000.
Liga, Donald J., to Kessler Products Co., Inc. Interlocking cardboard spool assembly. 3,958,775, Cl. 242-118.800.
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Loew, Theodore, to Standard Products Company, The. Dielectrically bondable decorative strips. 3,959,537, Cl. 428-31.000.

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Louis, Gerhard; and Bohm, Harald, to Licentia Patent-Verwaltungs-G.m.b.H. Electrode and spacer assembly for a fuel cell and fuel cell therewith. 3,959,017, Cl. 136-86.00D.

Loukes, David Gordon; Maltman, William Ramsey; and Howard, Colin Robert, to Pilkington Brothers Limited. Manufacture of glass. 3,958,969, Cl. 65-30.00E.

Loulan, James A., Jr.: *See—*
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Luckenbach, Edward C., to Exxon Research and Engineering Company. Catalyst regeneration apparatus. 3,958,953, Cl. 23-288.00B.

Lucki, Stanley J., to Mobil Oil Corporation. Olefin dimerization. 3,959,400, Cl. 260-683.15R.

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Lyall, Angus Alexander; and Johnston, Robert John, to Nabisco, Inc. Emulsified oil and sugar cereal coating and incorporating same. 3,959,498, Cl. 426-93.000.

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Mabuchi, Kenichi; and Tsuchimochi, Yoshihisa, to Mabuchi Motor Co. Ltd. Charger. 3,959,706, Cl. 320-2.000.

Mabuchi Motor Co. Ltd.: *See—*
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MacDermid Incorporated: *See—*
Grunwald, John J.; Kukanskis, Peter E.; Jacovich, Elaine F.; and D'Ottavio, Eugene D., 3,959,523.

MacKenzie, Burton Thornley, Jr., to General Electric Company. Pressureless curing system for chemically cross-linking ethylene-containing polymers and product formed thereby. 3,959,558, Cl. 428-379.000.

Mackrle, Svatopluk; and Mackrle, Vladimir, to Agrotechnika, narodny podnik. Apparatus for biological and chemical purification of water by agglomeration. 3,959,144, Cl. 210-201.000.

Mackrle, Vladimir: *See—*
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Maeda, Keikichi: *See—*
Ishii, Kunio; Izumiyama, Masao; and Maeda, Keikichi, 3,958,743.

Maeda, Kenji: *See—*
Umezawa, Hamao; Maeda, Kenji; and Kondo, Shinichi, 3,959,257.

Magin, Ralph W., to Monsanto Company. Chelates of 1,2-diaminocyclohexane tetrakis (methylene phosphonic acid) useful for supplying nutrient metals to plants growing in calcareous soil. 3,958,972, Cl. 71-27.000.

Magnaflux Corporation: *See—*
Conway, Edward F., 3,958,940.

Mago, Blake F.; and West, Charles W., to Union Carbide Corporation. Corrosion inhibitors for alkanolamine gas treating system. 3,959,170, Cl. 252-189.000.

Mahaffy & Harder Engineering Company: *See—*
Mahaffy, Reid A.; Kimbaris, James C.; and DiDonato, Russell D., 3,958,394.

Mahaffy, Reid A.; Kimbaris, James C.; and DiDonato, Russell D., to Mahaffy & Harder Engineering Company. Continuous movement packaging machine. 3,958,394, Cl. 53-112.00A.

Mahn, Frederick R.; and Ippolito, Emil A., to Drew Chemical Corporation. Non-foaming dispersing composition. 3,959,176, Cl. 252-352.000.

Maier, Lothar: *See—*
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Mainka, Joachim: *See—*
Stockinger, Alfred; and Mainka, Joachim, 3,958,885.

Makeham, Patricia L.; Smith, Donnie M.; and Beaty, Joseph D. Die cutter for forage cubing device. 3,958,911, Cl. 425-289.000.

Maki, Hidehiko: *See—*
Tanaka, Yoshinobu; Maki, Hidehiko; Ishiai, Tamio; Nishii, Tasaku; and Oota, Singi, 3,959,049.

Mallion, Keith Blakeney; Turner, Ralph William; and Todd, Alexander Henry, to Imperial Chemical Industries Limited. Morpholine derivatives. 3,959,273, Cl. 260-247.70S.

Maltman, William Ramsey: *See—*
Loukes, David Gordon; Maltman, William Ramsey; and Howard, Colin Robert, 3,958,969.

Mamin, Alexandr Ilich: *See—*
Somov, Boris Stepanovich; Mamin, Alexandr Ilich; Novikov, Andrei Porfirievich; Filippov, Vyacheslav Ivanovich; Khirdzhiev, Sergei Grigorievich; Gurevich, Vladimir Zakharovich; Voronov, Nikolai Stepanovich; and Agafonov, Ivan Fedorovich, 3,958,438.

Manber, Solomon. Watch display. 3,958,409, Cl. 58-50.00R.

Mandel, Carlos Dubinovsky. Plastic varnish coating with integral self-protecting formulation and process for producing the same. 3,959,199, Cl. 260-28.50R.

Mangood Corporation: *See—*
Johnson, Bernard A.; Klein, Roy W.; and Gardner, Frederick Philip, 3,959,636.

Manion, Francis M.; and Drzewiecki, Tadeusz M., to United States of America, Army. Flueric laminar digital amplifier. 3,958,602, Cl. 137-836.000.

Mann, Gary A. Stand for musical instruments. 3,958,786, Cl. 248-176.000.

Mann, Werner: *See—*
Rick, Manfred; Busch, Rolf; Renz, Klaus; Weber, Gunter; Mann, Werner; Schlaich, Helmut; Rohm, Ernst; Luders, Rudeger; and Wilhelm, Manfred, 3,958,325.

Mannesmann Aktiengesellschaft: *See—*
Hiersig, Heinz M.; Schafer, Wilhelm; Schuhmann, Bernd; and Thiemann, Max, 3,958,465.
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Mannesmannrohren-Werke AG: *See—*
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Mano, Mitsuhiko: *See—*
Nakajima, Nobuo; Aoki, Hisashi; Fujino, Masahiko; Nishimura, Osamu; Wakimasu, Mitsuhiro; and Mano, Mitsuhiko, 3,959,245.

Manufacture d'Appareillage Electrique de Cahors: *See—*
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Marancik, William G.; Ormand, Frederick T.; and Gregory, Eric, to Airco, Inc. Stabilized high-field superconductor. 3,958,327, Cl. 29-599.000.

Marans, Nelson S.: *See—*
Kehr, Clifton L.; and Marans, Nelson S., 3,959,191.

Marceau, J. Arthur: *See—*
Moji, Yukimori; and Marceau, J. Arthur, 3,959,091.

March, Joseph Eugene, to Platt Luggage, Inc. Luggage case with soft sided exterior. 3,958,676, Cl. 190-49.000.

March, Wayne Front. Non-invasive automatic glucose sensor system. 3,958,560, Cl. 128-2.00A.

Marchetti, John A., to Matsushita Electric Industrial Co., Ltd. Electro-optic tuning indicator. 3,959,729, Cl. 325-455.000.

Marco, George P.; and Krutis, Edward V., to Allis-Chalmers Corporation. Side loader main frame. 3,958,703, Cl. 214-75.00G.

Marcona Corporation: *See—*
Robinson, Charles W.; and Merklin, Kenneth E., 3,958,947.

Mardine, Pierre; and Allais, Lucien, to Le Nickel. Electrolytic cell. 3,959,111, Cl. 204-258.000.

Mareschi, Jean-Pierre; Sebesi, Suzanne; and Braye, Emile, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude; and Orsan, les Produits Organiques du Santerre. Insolubilization of proteins by chemical activation of a polymerized support and crosslinking of the protein to the support. 3,959,079, Cl. 195-63.000.

Marianeschi, Edmondo: *See—*
Barisoni, Mario; Barteri, Massimo; Brozzo, Pietro; Marianeschi, Edmondo; and Bitti, Roberto Ricci, 3,959,033.

Marine, Jean; and Rodot, Huguette, to Commissariat a l'Energie Atomique; Agence Nationale de Valorisation de la Recherche (ANVAR); and Agence Nationale de Valorisation de la Recherche Anvar. Method of preparation of a semiconducting ternary alloy from the semiconducting compound ZnTe by ion. 3,959,026, Cl. 148-1.500.

Marinelli, Donald Paul, III: *See—*
Ladany, Ivan; and Marinelli, Donald Paul, III, 3,959,522.

Marks, Gerald R.; and Schoepfle, Blaine O., to Hooker Chemicals & Plastics Corporation. Method of operating a three compartment electrolytic cell for the production of alkali metal hydroxides. 3,959,095, Cl. 204-98.000.

Markusch, Peter: *See—*
Dieterich, Dieter; Markusch, Peter; and Dietrich, Werner, 3,959,329.
Reiff, Helmut; Markusch, Peter; and Dieterich, Dieter, 3,959,348.

Maroschak, Ernest J., to Plastic Tubing, Inc. Corrugated plastic drainage pipe with integral coupler. 3,958,425, Cl. 61-11.000.

Marquez, Joseph A.: *See—*
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Marsden, James G.: *See—*
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Marsh, Richard O., Jr. Double tapered pipe coupling. 3,958,817, Cl. 285-16.000.

Martin Brothers, The: *See—*
Martin, James J., 3,958,712.

Martin, Edward J. Container with reversible dispenser. 3,958,729, Cl. 222-539.000.

Martin, James J., to Martin Brothers, The. Storage and carriage bin. 3,958,712, Cl. 217-40.000.

Martin Marietta Corporation: *See—*
Chocol, Clifford J.; and Polhemus, Carl E., 3,959,580.
Stephens, Charles W., 3,959,707.

Martin, Paul S. Coordination of robot and conveyor. 3,958,682, Cl. 198-19.000.

Martin, Richard L., to Petrolite Corporation. Multifunctional corrosion inhibitors. 3,959,177, Cl. 252-389.00A.

Martin, Richard R.: *See—*
Goodnight, Hershel E.; and Martin, Richard R., 3,958,922.

Martinez, Lenin F.: *See—*
Froman, Griff W.; Sok, Brian A.; Martinez, Lenin F.; and Mullins, Albert R., 3,959,099.

Martinsons, Aleksandrs: *See—*
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Martonair Limited: *See—*
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Marumo, Kuniomi: *See—*
Ishioka, Ryoji; Kametaka, Norio; and Marumo, Kuniomi, 3,959,297.

Maruzen Petrochemical Co., Ltd.: *See—*
Hayashi, Kiyoshige; Nakaniwa, Mikio; Yamamoto, Minoru; Ozaki, Kazuo; and Baba, Arimasa, 3,959,115.

Marvel, Fred D. Instantaneous photography camera. 3,959,803, Cl. 354-105.000.

Marvin Glass & Associates: *See—*
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Maschinenbau Oppenweiler GmbH, Firma: *See—*
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Maschinenfabrik Augsburg-Nurnberg AG: *See—*
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Maschinenfabrik Ruti AG: *See—*
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Masco, Donald; McNamara, Edward Joseph; McQuaide, Arnold Chester, Jr.; Pilc, Randolph John; and Warwick, Peter Stephen, to Bell Telephone Laboratories, Incorporated. Call initiation delay arrangement for digital data switching system. 3,959,599, Cl. 179-18.0EB.

Mashkovsky, Mikhail Davidovich; Glushkov, Robert Georgievich; Andreeva, Natalia Ivanovna; Smulevich, Anatoly Boleslavovich; Avrutsky, Grigory Yakovlevich; and Gromova, Valentina Vasilievna. Psychotropic medicinal preparation. 3,959,470, Cl. 424-250.000.

Mason, Marvin S.: *See—*
Bojanek, Robert J.; Field, Robert G.; and Mason, Marvin S., 3,959,596.

Mason, Richard Lewis, to Litton Industrial Products, Inc. Fitting assembly for flexible tubing. 3,958,818, Cl. 285-92.000.

Massachusetts Institute of Technology: *See—*
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Massek, Peter: *See—*
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Massey-Ferguson (Australia) Limited: *See—*
Stiff, Rodney A., 3,958,397.

Massey, Freddie L., to Goodyear Tire & Rubber Company, The. Low carboxyl high molecular weight polyesters. 3,959,228, Cl. 260-75.00T.

Masters, Philip C., to McNeil Corporation. Dual hose reel. 3,958,594, Cl. 137-355.170.

Masuda, Toshihiko: *See—*
Furuta, Isao; Yagaki, Kazuhito; and Masuda, Toshihiko, 3,959,441.

Masukawa, Toyoaki: *See—*
Fujiwhara, Mitsuto; Endo, Takaya; Satoh, Ryosuke; Masukawa, Toyoaki; and Nakagawa, Satoshi, 3,958,993.

Mateika, Dieter: *See—*
Herrnring, Jorg; Tolksdorf, Wolfgang; Rusche, Christian; Mateika, Dieter; and Winkler, Gerhard, 3,959,006.

Mathais, Henri; Schirmann, Jean-Pierre; Tellier, Pierre; and Weiss, Francis, to Produits Chimiques Ugine Kuhlmann. Method for preparing azines. 3,959,262, Cl. 260-240.00G.

Mathellier, Lionel J., to Draftex, S.A. Sealing strips and methods of making them. 3,958,369, Cl. 49-479.000.

Mathias, Robert G.: *See—*
Borrevik, Alexander J.; Cotton, Robert B., Jr.; and Mathias, Robert G., 3,958,483.

Mathis, Ronald D.; and Dix, James S., to Phillips Petroleum Company. Ultraviolet light stabilizing system. 3,959,218, Cl. 260-45.75N.

Matschinsky, Wolfgang; and Hadrys, Hans-Jochem, to Bayerische Motoren Werke Aktiengesellschaft. Rack and pinion steering mechanism and the mounting thereof at an automotive vehicle. 3,958,462, Cl. 74-498.000.

Matsubara, Masaki, to Olympus Optical Co., Ltd. Copying objective lens system. 3,958,866, Cl. 350-214.000.

Matsubara, Motoo: *See—*
Aoyama, Shigetsune; Kato, Masahiko; Matsubara, Motoo; and Furuta, Osamu, 3,958,732.

Matsuda, Yoshio; Yokota, Minoru; Hanaki, Yoshie; and Sumitomo, Megumu, to Sumitomo Electric Industries, Ltd. Method of manufacturing aluminum alloy electric conductors. 3,959,027, Cl. 148-2.000.

Matsudo, Kazuo; and Shimomura, Takayoshi, to Nippon Kokan Kabushiki Kaisha. Process of making cold reduced Al-stabilized steel having high drawability. 3,959,029, Cl. 148-12.00C.

Matsuhiro, Koichi: *See—*
Kurata, Naoji; Koshida, Kazuo; Fujii, Toshihiro; Matsuhiro, Koichi; and Okuda, Yukio, 3,959,389.

Matsumoto, Kazuo; and Kobayashi, Toshihiro, to Nippondenso Co., Ltd. Method of manufacturing commutator. 3,958,326, Cl. 29-597.000.

Matsumoto, Minoru: *See—*
Nakashima, Hachiro; Miwa, Suichiro; Yanahara, Hiroshi; Yoshida, Masakazu; and Matsumoto, Minoru, 3,958,831.

Matsumura, Koichi: *See—*
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Matsuo, Jon T.; and Utreja, Lajpat, to United States of America, Navy. Convertible canopy-to-wing shaped parachute. 3,958,780, Cl. 244-152.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Ikushima, Horishi; and Yamaoki, Hideo, 3,959,749.
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Matsuyama Petrochemicals Inc.: *See—*
Shigeyasu, Motoo; Ozaki, Takeo; and Kusano, Nobuo, 3,959,449.

Mattes, Hans George; and Torok, Gabor Peter, to Bell Telephone Laboratories, Incorporated. Graphical input terminal. 3,959,585, Cl. 178-18.000.

Matthaus, Gunther: *See—*
Penczynski, Peter; Jacobsen, Peter; Matthaus, Gunther; and Massek, Peter, 3,959,549.

Mattioli, Franco; and Guanciale, Oliviero, deceased (by Guanciale, Eufrasia Fortunata Di Scenna, heir), to Montecatini Edison S.p.A. Method for preparing alpha-olefin polymers. 3,959,243, Cl. 526-494.000.

Matty, Robert E.: *See—*
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Matula, Jerry: *See*—
Gervais, William J.; and Matula, Jerry, 3,958,777.
Mauder, George C., Jr.: *See*—
Rath, Eric; and Mauder, George C., Jr., 3,958,427.
Mauer, Paul B., to Eastman Kodak Company. Light source for optical sound recording and reproduction apparatus. 3,959,655, Cl. 250-474.000.
Maxjushin, Anatoly Fedorovich: *See*—
Redko, Sergei Georgievich; Korolev, Albert Viktorovich; Maxjushin, Anatoly Fedorovich; Kreps, Moisei Solomonovich; and Gorokhov, Fedor Vasilievich, 3,958,371.
Maxon Industries, Inc.: *See*—
Perkins, William V., 3,958,664.
Mayo, E. Raymond, to Hurtt, Walter K., a part interest. Dual direction indicator. 3,959,768, Cl. 340-82.000.
Mazdiyasni, Khodabakhsh S.; and Cooke, Charles M., to United States of America, Air Force. Synthesis of high purity, alpha phase silicon nitride powder. 3,959,446, Cl. 423-344.000.
McAleer, William J.: *See*—
Miller, William J.; Spier, Raymond E.; and McAleer, William J., 3,959,074.
McBriar, David John; Murfitt, Harry Charles; and Bohun, Robert Edward, to Imperial Chemical Industries Limited. Surfactants and their use in foamable polymer compositions. 3,959,188, Cl. 260-2.50P.
McBurnett, James R., to Tyrone Hydraulics, Inc. Flow compensating emergency hydraulic system. 3,958,657, Cl. 180-133.000.
McCabe, Douglas. Process for preparing quick-cooking brown rice and the resulting product. 3,959,515, Cl. 426-627.000.
McCartan, Daniel A.; and Corcoran, Neal A., Jr., to Owens-Corning Fiberglas Corporation. Coated molded panel member. 3,959,572, Cl. 428-172.000.
McCool, John B., 3rd: *See*—
Putman, Edgar N.; Patterson, George; Wimer, Scotty; and McCool, John B., 3rd, 3,959,193.
McCormack, John F.: *See*—
Schneble, Frederick W., Jr.; McCormack, John F.; and Zeblisky, Rudolph J., 3,959,531.
McCormick, Norman J., to United States of America, Energy Research and Development Administration. Method of preparing gas tags for identification of single and multiple failures of nuclear reactor fuel assemblies. 3,959,069, Cl. 176-19.0LD.
McCrea, Terrance Francis, to Fedders Corporation. Solid state motor starter and overload protector circuit. 3,959,704, Cl. 318-387.000.
McCugh, Ralph, to United States of America, Energy Research and Development Administration. Reactor hold-down arrangement. 3,959,073, Cl. 176-85.000.
McCulloch, Charles R.; and Gill, Robert C., to United States of America, Navy. High impetus, low flame temperature, composite propellants and method of making. 3,959,042, Cl. 149-19.920.
McDonald, David Ian; Sederberg, George William; Stephenson, Gary David; and Wiatt, James Gordon, to Cincinnati Milacron, Inc. Coupling for handling workpiece, conveyor combined therewith, and method. 3,958,685, Cl. 198-179.000.
McDonald, George R.: *See*—
Green, Donald M.; and McDonald, George R., 3,958,295.
McFarland, Philip J.: *See*—
Rambauske, Werner R.; and McFarland, Philip J., 3,959,738.
McGahee, Francis M. Credit card monitor. 3,959,789, Cl. 340-280.000.
McGilvray, Malcolm C., Jr.: *See*—
Durland, Douglas H.; Chervenka, Charles H.; and McGilvray, Malcolm C., Jr., 3,958,753.
McGinniss, Vincent Daniel, to SCM Corporation. Photopolymerizable coating compositions containing activated halogenated azine photoinitiator and process for making same. 3,959,100, Cl. 204-159.150.
McGowan, Marvin E.: *See*—
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McGregor, J. Donald: *See*—
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McIlroy, Robert A.; Matty, Robert E.; and Lapple, Walter C., to Babcock & Wilcox Company, The. Process and apparatus for recovery of sulfur from a polysulfide pulping operation. 3,959,068, Cl. 162-17.000.
McKenna, Arthur L., III, to Kraftco Corporation. Stabilized fatty acids. 3,959,321, Cl. 260-398.500.
McKenzie, Leo A. Brick hanger. 3,958,789, Cl. 248-340.000.
McMorran, Robert E.: *See*—
Gilbert, Gerard B., Jr.; and McMorran, Robert E., 3,959,716.
McNamara, Edward Joseph: *See*—
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McNeil Corporation: *See*—
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Masco, Donald; McNamara, Edward Joseph; McQuaide, Arnold Chester, Jr.; Pilc, Randolph John; and Warwick, Peter Stephen, 3,959,599.
Mead, Carver, to California Institute of Technology. Processor which sequences externally of a central processor. 3,959,774, Cl. 340-172.500.
Medlin, John B., to United States of America, Energy Research and Development Administration. Charging machine. 3,958,699, Cl. 214-23.000.
Medvid, Richard J.: *See*—
King, Walter C.; and Medvid, Richard J., 3,959,541.
Meese, John W., to Emerson Electric Co. Torque wrench. 3,958,469, Cl. 81-58.300.
Megumi, Naomitsu, to Megumi, Naomitsu; and Tokyo Plywood Kabushiki Kaisha. Structure assembled of the unit bodies having stone-like type shells and an insulating insert. 3,958,384, Cl. 52-477.000.
Mehta, Madhukumar A., to GTE Automatic Electric Laboratories Incorporated. Traffic analysis from a scanner using a micro-processor. 3,959,593, Cl. 179-8.00A.
Mehta, Rustam J.; and Geilhufe, Michael, to Intel Corporation. Semiconductor random access memory. 3,959,781, Cl. 340-173.00R.
Meier, Michael J., to Actron. High speed optical read-out of data stored in an array. 3,959,784, Cl. 340-173.0LM.
Meiji Seika Kaisha, Ltd.: *See*—
Inouye, Shigeharu; Omoto, Shoji; Iwamatsu, Katsuyoshi; Niida, Taro; Kawasaki, Toyoaki; and Tsuruoka, Takashi, 3,959,256.
Meinzer, Richard A., to United Technologies Corporation. Interhalogen based combustion-driven laser which provides continuous wave output lasing from dual species. 3,959,741, Cl. 331-94.50G.
Memoli, Steven J. Deep sea tank and seaport system. 3,958,521, Cl. 114-.50T.
Memorex Corporation: *See*—
Carroll, Thomas D., 3,959,618.
Menon, Sukumaran K.; and Guran, Zenon, to Xerox Corporation. Half-tone screen with cleaning means for an electrophotographic printing machine. 3,958,877, Cl. 355-4.000.
Mentschel, Hellmuth, to Siemens Aktiengesellschaft. Heat exchanger for catalytic gas converters. 3,958,631, Cl. 165-166.000.
Merchants National Bank of Manchester: *See*—
Rossborough, John C., 3,958,313.
Merck & Co., Inc.: *See*—
Jones, Howard, 3,959,253.
Lawrence, William Grove; and Sauter, Wolfgang Juergen, 3,959,633.
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Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Orth, Hans Dieter; Brummer, Wolfgang; Klockow, Michael; and Hennrich, Norbert, 3,959,080.
Mergens, William Joseph; and Newmark, Harold Leon, to Hoffmann-La Roche Inc. Treatment of tobacco with ascorbic acid. 3,958,580, Cl. 131-17.00R.
Mergenthaler Linotype GmbH: *See*—
Plaot, Michael, 3,959,802.
Merkel, George; and Dietz, John F. W., to United States of America, Army. Simulation of Lorentz plasma by random distribution of inductively-loaded dipoles. 3,959,796, Cl. 343-909.000.
Merkl, George G. Aluminum hydrates and salts of carboxylic acids. 3,959,093, Cl. 204-72.000.
Merkle & Associates, Inc.: *See*—
Merkle, Frank P., Jr., 3,958,519.
Merkle, Frank P., Jr., to Merkle & Associates, Inc. High temperature furnace construction and hangers therefor. 3,958,519, Cl. 110-99.00R.
Merklin, Kenneth E.: *See*—
Robinson, Charles W.; and Merklin, Kenneth E., 3,958,947.
Merlet, Pierre; Vernezy, Jacques; and Barigot, Jean-Claude, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Installation for checking a repeater of a transmission route. 3,959,606, Cl. 179-175.31R.
Merriken, Lyal N.: *See*—
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Merrow Machine Company, The: *See*—
Pierce, Bernard N., 3,958,460.
Messmann, Helen; and Pfeufer, Carl T., to Lawrence Peska Associates, Inc., a part interest. Refrigeration alarm. 3,959,787, Cl. 340-227.00R.
Messner, Georg. Method for the fabrication of pure alumina from Al_2O_3 and silica containing raw materials by leaching with hydrochloric acid. 3,959,438, Cl. 423-126.000.
Messwandler-Bau GmbH: *See*—
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Metal Buildings Insulation, Inc.: *See*—
Bondra, John, Jr.; and Ruhling, William R., 3,958,385.
Metcalf, Brian Walter; and Jung, Michel, to Richardson-Merrell Inc. Acetylene derivatives of amino acids. 3,959,356, Cl. 260-482.00R.
Metcalf & Eddy, Inc.: *See*—
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Meyer, Harry C., III: *See*—
Roberts, Thomas G.; Shatas, Romas A.; Meyer, Harry C., III; and Stettler, John D., 3,959,659.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. 2-Amino-4,5-dihydropyridine derivatives. 3,959,292, Cl. 260-293.690.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, to Bayer Aktiengesellschaft. 2,6-Diamino-1,4-dihydropyridine-3,5-dicarboxylic acid esters used as coronary vessel dilators and anti-hypertensive agents. 3,959,474, Cl. 424-266.000.
Meyer, Horst: *See*—
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Meyer Industries, Inc.: *See—*
Meyer, Roy E., 3,958,381.
Meyer, Robert W.; and Schrick, Richard I., to United States of America, Navy. Throttle control for remote air driven devices. 3,958,597, Cl. 137-546.000.
Meyer, Roy E., to Meyer Industries, Inc. Concrete filled tapered tubular tower. 3,958,381, Cl. 52-303.000.
Meyers, Jess Edward. Method and apparatus for drying wigs. 3,958,340, Cl. 34-1.000.
Meyers, Robert E. Flower pot. 3,958,366, Cl. 47-38.100.
Meyn, Pieter. Apparatus for opening the body cavity of a fowl. 3,958,302, Cl. 17-11.000.
Michel, Walter: *See—*
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Mihelich, Frederick A., to Sperry Rand Corporation. Transient turn-on protection circuit for power supplies. 3,959,714, Cl. 323-17.000.
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Mikolajczak, Kenneth L.; and Smith, Cecil R., Jr., to United States of America, Agriculture. Synthesis of antitumor alkaloid deoxyharringtonine and its precursor 3'-0-(5-methyl-2-oxohexanoyl)-cephalotaxine. 3,959,312, Cl. 260-326.290.
Mikovsky, Richard J.; and Silvestri, Anthony J., to Mobil Oil Corporation. Desulfurization catalysts. 3,959,179, Cl. 252-455.00Z.
Mikulicz, Michael Z.; Boney, William G.; and Vora, Bipin V., to Universal Oil Products Company. Separation of HF from polymer, constant boiling mixture relief gases and vent gases in alkylation process. 3,959,402, Cl. 260-683.480.
Milicevic, Branimir: *See—*
Graff, Gustaf; Angliker, Hans-Jorg; Peter, Richard; Milicevic, Branimir; Hoster, Hansruedi; and Defago, Raymond, 3,958,933.
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Miller, Franklin G., to Moog Inc. Multiple displacement hydraulic motor drive apparatus. 3,958,494, Cl. 91-411.00A.
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Miller, Raymond E.: *See—*
Bickoff, Emanuel M.; de Fremery, Donald; Edwards, Richard H.; Knuckles, Benny E.; Kohler, George O.; and Miller, Raymond E., 3,959,246.
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Miller, Walter E., Jr.; and Dent, Irvin E., to United States of America, Army. Digital rangefinder correlation. 3,959,641, Cl. 235-181.000.
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Miller, William P.; and Twigg, Robert W., to Polytube, Inc. Apparatus for manufacturing the body portion of a collapsible squeeze tube. 3,959,066, Cl. 156-459.000.
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Millward, Richard S., to Dorr-Oliver Incorporated. Sewage handling and disposal process for chloride (NaCl) contaminated sludges. 3,959,126, Cl. 210-10.000.
Milner, Edwin Earl, Jr. Lightweight high strength boom construction. 3,958,377, Cl. 52-118.000.
Milty Products Limited: *See—*
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Mizuki, Yoshiaki, to Nihon Beru-Haueru Kabushiki Kaisha. Sound system pinch roller actuating device. 3,958,868, Cl. 352-27.000.
Mizuno, Minoru; and Iwata, Tomoji, to Nippon Kokan Kabushiki Kaisha. Method for removing SO_2 and NO_2 simultaneously from the exhaust of a combustion furnace. 3,959,440, Cl. 423-239.000.
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Moore, L. Frank, to Frymaster Corporation, The. Spaghetti cooking system. 3,958,503, Cl. 99-327.000.

Moore, Robert M. Air line lubricator safety device. 3,958,663, Cl. 184-6.400.

Morales, John J., to S.R.C. Laboratories, Inc. Photomultiplier tube having a plurality of sensing areas. 3,959,680, Cl. 313-95.000.

More, Anton, to Wacker-Chemie GmbH. Molten basic welding fluxes low in manganese and with low moisture sensitivity. 3,959,031, Cl. 148-26.000.

Morelli, Morello: *See*—
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Morozowich, Walter, to Upjohn Company, The. Phenyl and naphthyl esters of $PGF_{2\alpha}$ type prostaglandins. 3,959,319, Cl. 260-390.000.

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Morrison, Willard L. Antimicrobial blended yarns and fabrics comprised of naturally occurring fibers. 3,959,556, Cl. 428-364.000.

Morrow, James J., to Fischer & Porter Co. In-line residual chlorine analyzer. 3,959,087, Cl. 204-1.00T.

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Mundy, Philip W. Cast iron pipe cutter. 3,958,329, Cl. 30-97.000.

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Nakajima, Nobuo; Aoki, Hisashi; Fujino, Masahiko; Nishimura, Osamu; Wakimasu, Mitsuhiro; and Mano, Mitsuhiko, to Takeda Chemical Industries, Ltd. L-Aspartyl-aminomalonic acid methyl 2-methylcyclohexyl diester. 3,959,245, Cl. 260-112.50R.

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Nakamura, Yasushi; Agatsuma, Kunio; Tanaka, Yoshihiro; and Aono, Shunji, to Sumitomo Chemical Company, Limited. Phenoxy carboxylic acid derivatives as anti-atheroslerosis agents. 3,959,484, Cl. 424-308.000.

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Nakashima, Hachiro; Miwa, Suichiro; Yanahara, Hiroshi; Yoshida, Masakazu; and Matsumoto, Minoru, to Kabushiki Kaisha Komatsu Seisakusho. Tunnel excavator. 3,958,831, Cl. 299-64.000.

Nakata, Josuke, to Mitsubishi Denki Kabushiki Kaisha. Thermally sensitive switch device. 3,959,621, Cl. 219-501.000.

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Narancic, Vojislav, to Institut de Recherches de l'Hydro-Quebec (IREQ). Integrated circuit for control of the transient recovery voltage in direct and synthetic testing of high voltage circuit breakers. 3,959,722, Cl. 324-28.0CB.

Narayan, Subrahmanyam Yegna: *See—*
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Nardino, Righi, to Elpro S.A. Sound recording and/or reproducing apparatus with movable carriage receiving removable tape cassette. 3,959,821, Cl. 360-96.000.

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Nayler, John Herbert Charles; Pearson, Michael John; and Southgate, Robert, to Beecham Group Limited. 3-(2'-Tetrahydropyranylmethyl)-7-(2-thienylacetamido)-3-cephem-4-carboxylic acid and non-toxic salts thereof. 3,959,267, Cl. 260-243.00C.

Naz, John F. Scented ring for candles. 3,958,917, Cl. 431-289.000.

NCR Corporation: *See—*
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Nees, Donald M.; Lindstrum, Alan L.; and Barlow, Michael L., to United States of America, Navy. Target simulator system. 3,959,766, Cl. 340-3.00E.

Nelson, Robert E.; and Gilbert, Robert D., to Roberts' Products, Inc. Sealing means for wind instruments. 3,958,484, Cl. 84-380.00R.

Nemeth, Joseph, to Champion Spark Plug Company. Modified copper-aluminum suppressor element. 3,959,184, Cl. 252-521.000.

Nersesian, Ara; Hubner, Fred; and Durbak, Taras, to Bristol-Myers Company. Hair dressing compositions containing a hair substantive quaternary resin. 3,959,463, Cl. 424-70.000.

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Newsom, Harley Monroe; and Patten, Michael Allen, to International Business Machines Corporation. Digital calling signal tone generating circuitry. 3,959,604, Cl. 179-84.0VF.

Newsom, Raymond A.: *See—*
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Nichols, Donald K.; and Strahan, Virgil H., to United States of America, Navy. Radiation hardened plated wire for memory. 3,959,785 Cl. 340-174.0TF.

Nichols, Louis B. Washing machine drain filter. 3,959,138, Cl. 210-94.000.

Nicholson, John S.: *See—*
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Nicolaus, Horst: *See—*
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Nidelkoff, James G., to Minnesota Mining and Manufacturing Company. Telescoping support for elevated signboard. 3,958,349, Cl. 40-125.00H.

Nielsen, Edwin: *See—*
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Niemann, Klaus, to Daimler-Benz Aktiengesellschaft. Installation for compensating forces acting transversely to the driving direction on a fast moving vehicle. 3,958,656, Cl. 180-79.100.

Nienart, Louis F., to Allied Chemical Corporation. Orthopedic bandage core. 3,958,728, Cl. 222-519.000.

Nienburg, Hans Juergen; Kniese, Wilhelm; Kummer, Rudolf; and Tavs, Peter, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of alcohols and/or aldehydes. 3,959,385, Cl. 260-604.0HF.

Nifco Inc.: *See—*
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Nigam, Anant K.: *See—*
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Niki, Hiroshi; Deya, Eiki; Doi, Toru; Igarashi, Seiichiro; Ahiko, Kenkichi; and Hayashi, Hiromichi, to Snow Brand Milk Products Co., Ltd. Method of preparing fish meat powder having KAMABOKO-forming property. 3,959,517, Cl. 426-643.000.

Nikkei Aluminium Company, Ltd.: *See—*
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Nilssen, Albert G.; and Tunzi, Burton R., to Tone Technology Corporation. Dual tone multiple frequency receiver/decoder. 3,959,603, Cl. 179-84.0VF.

Nilsson, Harald: *See—*
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Nippon Chemicals Co., Ltd.: *See—*
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Nippon Cloth Industry Co., Ltd.: *See—*
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Nippon Gakki Seizo Kabushiki Kaisha: *See—*
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Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See—*
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Nippon Kayaku Kabushiki Kaisha: *See—*
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Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
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Nishigaki, Masahiko; Ohnishi, Masami; Ichikawa, Yosuke; and Katayama, Kazuhiko, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method of polymerizing vinyl chloride. 3,959,235, Cl. 526-62.000.

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Nishino, Atsushi; Kumano, Hiroshi; Noguchi, Yoshinori; Sonetaka, Kazunori; and Amano, Yasuji, to Matsushita Electric Industrial Co., Ltd. Novel manganese dioxide. 3,959,021, Cl. 136-138.000.

Nishio, Daijiro: *See—*
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Nissel, Frank R., to Welex, Incorporated. Method and apparatus for making multiple-layered sheets. 3,959,431, Cl. 264-171.000.

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Noda, Fumiyoshi; and Takeuchi, Yukihisa, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Nippondenso Co., Ltd. High-temperature heat-insulating structure. 3,958,582, Cl. 138-149.000.

Noda, Hideyo; Kawai, Norio; Tarue, Osamu; Fukada, Kazuo; Idehara, Sigeyoshi; Nakanishi, Tadao; Kakimoto, Yuzo; and Nakamura, Yoshito, to Toyo Rubber Industry Co., Ltd., The; and Kawasaki Jukogyo Kabushiki Kaisha. Method of burning emulsion oils. 3,958,915, Cl. 431-9.000.

Nodwell, John H., to Foremost International Industries Ltd. Segmented track. 3,958,839, Cl. 305-35.00R.

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Northeimer, Evan S., deceased (by Northeimer, Margaret, executrix), to Du Pont de Nemours, E. I., and Company. Two-stage converson of methanol to formaldehyde. 3,959,383, Cl. 260-603.00C.

Northeimer, Margaret, executrix: *See—*
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November, Milton H., to International Telephone and Telegraph Corporation. Discontinuity suppression apparatus for vibration densitometers. 3,958,446, Cl. 73-32.00A.

Novice, Michael A., to Dart Industries Inc. Apparatus for coating an article. 3,958,530, Cl. 118-48.000.

Novikov, Andrei Porfirievich: *See—*
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Nussbaumer, Henri J., to International Business Machines Corporation. Digital filter. 3,959,637, Cl. 235-152.000.

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Oakley, Harold C.; and Sypitkowski, James R., to Carborundum Company, The. Filter element assembly. 3,959,147, Cl. 210-323.00T.

Oberhofer, Alfred W.; Benko, James J.; and Drozd, Joseph C., to Nalco Chemical Company. Cleaner for automotive engine cooling system. 3,959,166, Cl. 252-146.000.

Oberlin, Lyman M., to Phillips Petroleum Company. Block polymer preparation. 3,959,412, Cl. 260-880.00B.

O'Brien, Sean A.: *See—*
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Ochsner, Paul; and Vaterlaus, Bruno Peter, to Givaudan Corporation. Unsaturated alcohols and perfume compositions containing same. 3,959,396, Cl. 260-632.00R.

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Oda, Nakaaki; Horie, Yoshio; Idohara, Mitsuru; and Hukui, Takeo, to Nippon Soda Company Limited. Isocyanate resin absorbent for free chlorine, heavy metals and heavy metallic compounds. 3,959,149, Cl. 260-77.50R.

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Ogawa, Oyuki, to Nippondenso Co., Ltd. Spring-loaded fuel storing device. 3,958,547, Cl. 123-198.00D.

Ogawa, Seiichiro; and Suami, Tetsuo, to Tetsyi Syanu. 2,5-Dideoxystreptamine and the production thereof. 3,959,375, Cl. 260-563.00R.

Ogilvie, Samuel P.; Bolton, Lorne F.; and Dingman, Charles W., to Beacon Herald of Stratford, Limited, The. Water supply apparatus for printing machines. 3,959,806, Cl. 354-297.000.

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Ohhinata, Ichiro; and Okuhara, Shinzi, to Hitachi, Ltd. Semiconductor bidirectional switch circuit. 3,959,668, Cl. 307-252.00G.

Ohi, Nobuaki; Ito, Kanzi; Kamata, Katsuo; and Sato, Masaru, to Tohoku Metal Industries Limited. Two gap read/write head assembly. 3,959,824, Cl. 360-124.000.

OHJI Seiki Kogyo Kabushiki Kaisha: *See—*
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Ohki, Yoshinori; and Kato, Yoshio, to Ji-ji Denki Kogyo K.K. Ignition circuit for the internal combustion engine and premature ignition prevention method in the ignition device. 3,958,546, Cl. 123-148.00E.

Ohnishi, Masami: *See—*
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Okaniwa, Tetsuo; and Abeta, Sadaharu, to Sumitomo Chemical Company, Limited. Dischargeable black dyeing on acid modified polyester fiber. 3,958,287, Cl. 8-26.000.

Okasaka, Hotuma: *See—*
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Omeechevarria, Gerardo. Burial crypt. 3,958,378, Cl. 52-136.000.

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Onoda, Takeru; Wada, Keisuke; and Otake, Masayuki, to Mitsubishi Chemical Industries Ltd. Process for preparing a carboxylic ester. 3,959,352, Cl. 260-479.00R.

Onoda, Takeru; and Wada, Keisuke, to Mitsubishi Chemical Industries Ltd. Process for preparing phenyl ester. 3,959,354, Cl. 260-479.00R.

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Orban, Ivan; Lind, Hanns; Brunetti, Heimo; Rody, Jean; and Rasberger, Michael, to Ciba-Geigy Corporation. Process for the preparation of 2,2,6,6-tetramethyl-4-oxopiperidine. 3,959,295, Cl. 260-293.890.
Ordway, Richard S., to Circle Machine Co., Inc. Pressure regulator for spray systems. 3,958,724, Cl. 222-318.000.
Ore, Svein: *See*—
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Ouellette, Ronald J.; Canney, Robert S.; and Stetson, Ralph B., to General Electric Company. Dry type instrument transformer with potential tap and connector therefor. 3,959,760, Cl. 336-84.000.
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Padden, William R. Vertical blower coil unit for heating and cooling. 3,958,628, Cl. 165-35.000.
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Pangonis, William James, to Du Pont de Nemours, E. I., and Company. Process for preparing polymeric surfaces to improve antistatic and soil resistant properties. 3,959,566, Cl. 428-446.000.
Paoli, Stephen A. Meat separator machine with temperature reducing means. 3,958,763, Cl. 241-54.000.
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Parent, Richard A., to Xerox Corporation. Transferring toner to an amine coated sheet. 3,958,990, Cl. 96-1.400.
Park, Kisoon; Readshaw, Ronald L.; and Lourigan, George H., to Union Carbide Corporation. Process for producing fibers. 3,959,534, Cl. 427-390.000.
Parks, Lawrence Roy; and Builder, Stuart Elliot, to Procter & Gamble Company, The. Hair care products containing flourocarbon polymers for keeping hair cleaner longer. 3,959,462, Cl. 424-70.000.
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Penczynski, Peter; Jacobsen, Peter; Matthaus, Gunther; and Massek, Peter, to Siemens Aktiengesellschaft. Multi-layer insulation for deep-cooled cables. 3,959,549, Cl. 428-213.000.
Penczynski, Peter; and Schmidt, Fritz, to Siemens Aktiengesellschaft. Apparatus for supplying power to electrical devices having conductors cooled to a low temperature. 3,959,576, Cl. 174-15.0BH.
Penetryn System, Inc., The: *See*—
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Penzkofer, Franz; and Wiesbock, Josef, to Hans Kolb KG. Storage device for a safety belt with vehicle-sensitive locking. 3,958,774, Cl. 242-107.40A.
Pepe, Enrico J.; and Marsden, James G., to Union Carbide Corporation. Organofunctional silicon compounds. 3,959,327, Cl. 260-448.80R.
Pera, John D.: *See*—
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Perkins, William V., to Maxon Industries, Inc. Fail safe mechanism for automatically de-energizing a multi-post vehicle hoist. 3,958,664, Cl. 187-8.470.
Pertec Corporation: *See*—
Gervais, William J.; and Matula, Jerry, 3,958,777.
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Peter, Richard: *See*—
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Peters, Arnold. X-ray film apparatus. 3,959,656, Cl. 250-476.000.

Peters, Edwin F., to Owens-Illinois, Inc. Control apparatus for supplying operating potentials. 3,959,669, Cl. 307-262.000.
Peters, Thomas O. Drumstick. 3,958,485, Cl. 84-422.00S.
Petersen, Carl Herbert; and Gunnergaard, Marius, to Dansk Industri Syndikat A/S. Method for the separation of castings from casting moulds or similar material and a foundry machine for carrying out this method. 3,958,619, Cl. 164-131.000.
Peterson, Donald John; and Robbins, Medford Dwight, to Procter & Gamble Company, The. Alkyltin cyclopropylcarbinylsulfonate. 3,959,324, Cl. 260-429.700.
Peterson, Richard M.: *See—*
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Pieszchala, Chester A. Signal device for use in conjunction with a mailbox, newspaper tube, lock box or similar device. 3,958,752, Cl. 232-35.000.
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Pilc, Randolph John: *See—*
Masco, Donald; McNamara, Edward Joseph; McQuaide, Arnold Chester, Jr.; Pilc, Randolph John; and Warwick, Peter Stephen, 3,959,599.
Pilkington Brothers Limited: *See—*
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Plaot, Michael, to Mergenthaler Linotype GmbH. Means for recording character images in side by side relationship in a photocomposing machine. 3,959,802, Cl. 354-12.000.
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Polinsky, Murray Arthur, to RCA Corporation. Method of making an insulated gate field effect transistor. 3,959,025, Cl. 148-1.500.
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Pollock, Eugene B. Building structural system. 3,958,386, Cl. 52-488.000.
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Pollock, James Richard Allen; and Weir, Michael Joseph, to Pollock, James R. A. Apparatus for preparing fermented liquids. 3,959,120, Cl. 195-141.000.
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Pomfret, Edward E., to Gillette Company, The. Shaving system. 3,958,692, Cl. 206-359.000.
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Poot, Albert Lucien; Lemahieu, Raymond Gerard; Janssens, Wilhelmus; and de Jaeger, Antoine August, to AGFA-GEVAERT N.V. Pressure-sensitive recording materials. 3,958,815, Cl. 282-27.500.
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Presson, Jerry Mayronne, to Harvey Hubbell Incorporated. Electrical wiring device. 3,958,856, Cl. 339-113.00R.

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Raczkowski, Mark B. Ash tray with smoke filter. 3,958,965, Cl. 55-385.00G.

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Rambauske, Werner R.; and McFarland, Philip J., to Raytheon Company. Laser. 3,959,738, Cl. 331-94.50C.

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Rastas, Jussi Kalevi; Huggare, Tor-Leif Johannes; and Fugleberg, Sigmund Peder, to Outokumpo Oy. Hydrometallurgical process for the recovery of zinc, copper and cadmium from their ferrites. 3,959,437, Cl. 423-36.000.

Ratcliffe, Eldon S.: *See—*
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Rath, Eric; and Mauder, George C., Jr., to Frigitemp. Fresh produce barge. 3,958,427, Cl. 62-62.000.

Rath, Lucien M.; and Clark, James L., to Plastronics, Inc. Method and apparatus for butt-welding tubular plastic members to each other. 3,959,058, Cl. 156-272.000.

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Rebora, Pierluigi: *See—*
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Reeves, Melbourne C., to Keene Corporation. Lighting fixture. 3,959,578, Cl. 174-65.00R.

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Reiff, Helmut; Markusch, Peter; and Dieterich, Dieter, to Bayer Aktiengesellschaft. Liquid organic polyisocyanates containing carboxyl and/or carboxylate groups. 3,959,348, Cl. 260-471.00C.

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Renz, Klaus: *See—*
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Reuter, Guido; and Robertz, Hans, to Rheinstahl Giesserei A.G. Method for producing blank metal ingots of uniform cross section and in particular steel ingots. 3,958,620, Cl. 164-133.000.

Reuther, Maurice A. Tire changer machine. 3,958,618, Cl. 157-1.200.

Reuting, Hans-Werner, to Elmeg Elektro-Mechanik GmbH. Contact drive for electro-magnetic relays. 3,959,759, Cl. 335-203.000.

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Rhee, Dong Woo; and Funston, David Lee, to GTE Sylvania Incorporated. Television receiver remote control. 3,959,727, Cl. 325-390.000.

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Rhodes, William A. Method of casting an alloy having the appearance of gold. 3,958,322, Cl. 29-527.600.

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Rhone-Poulenc-Textile: *See—*
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Rhoton, Richard S., to Westinghouse Electric Corporation. Vehicle zero speed detection system. 3,958,783, Cl. 246-182.000.

Ribka, Joachim: *See—*
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Richards, Frank P., to Phillips Petroleum Company. Apparatus for forming a convoluted container sidewall. 3,958,501, Cl. 93-39.00C.

Richards, Mildred C.: *See—*
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Richardson, Anthony Charles, to Inspection Technology Development, Inc. Ultrasonic inspection apparatus. 3,958,451, Cl. 73-67.80S.

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Richter, Sidney B.; and Kyker, Glendon D., to Velsicol Chemical Corporation. N-(Halobenzoyl) hexahalo-3,5-methanotetrahydrophthalimides. 3,959,216, Cl. 260-45.75B.

Richter, Sidney B.; and Kyker, Glendon D., to Velsicol Chemical Corporation. N-(halobenzoyl)-4,5-dibromo-3,6-methanohexahydrophthalimides. 3,959,217, Cl. 260-45.75B.

Richter, Sidney B.; Stach, Leonard J.; and Wilke, Robert N., to Velsicol Chemical Corporation. Insecticidal 2-phenyl-4-benzoyl-1,2,4-oxadiazolidine-3,5-diones. 3,959,478, Cl. 424-272.000.

Richtzenhain, Hermann; and Stephan, Rudolf, to Dynamit Nobel Aktiengesellschaft. Stabilization of 1,1,1-trichloroethane with a three component system. 3,959,397, Cl. 260-652.50R.

Rick, Manfred; Busch, Rolf; Renz, Klaus; Weber, Gunter; Mann, Werner; Schlaich, Helmut; Rohm, Ernst; Luders, Rudeger; and Wilhelm, Manfred, to Robert Bosch G.m.b.H. Method and apparatus for making stators for electrical machines. 3,958,325, Cl. 29-596.000.

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Cleer, Clarence W., Jr., 3,958,755.

Ridlehuber, Eugene V. Storage unloading process. 3,958,706, Cl. 214-152.000.

Riedl, Peter A.: *See—*
Arkell, Alfred; Riedl, Peter A.; and Kerr, Edwin R., 3,959,381.

Riedle, Robert D., to Third Arm. Inc. Luggage handle extension handle. 3,958,731, Cl. 224-58.000.

Rippin, Donald R.: *See—*
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Robbins, Medford Dwight: *See—*
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Roberts, Charles Sheldon: *See—*
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Roberts, Frederic Francis, to Post Office, The. Dielectric optical waveguides. 3,958,861, Cl. 350-96.00C.

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Roberts, James Stewart; and Craig, Robert Lyle, to Imperial Chemical Industries Limited. Cyclic amine stabilizers. 3,959,214, Cl. 260-45.80N.

Roberts' Products, Inc.: *See—*
Nelson, Robert E.; and Gilbert, Robert D., 3,958,484.

Roberts, Thomas G.; Shatas, Romas A.; Meyer, Harry C., III; and Stettler, John D., to United States of America, Army. Intense, energetic electron beam assisted fusion neutron generator. 3,959,659, Cl. 250-501.000.

Robertshaw Controls Company: *See—*
Bauer, Frederick T.; and Geary, Frederick J., 3,959,697.

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Robertz, Hans: *See—*
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Robins, Charles T.: *See—*
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Robinson, Charles W.; and Merklin, Kenneth E., to Marcona Corporation. Hydrometallurgical leaching apparatus. 3,958,947, Cl. 23-270.00R.

Robinson, Harry D., Jr.: *See—*
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Robinson, Morton: *See—*
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Chana, Maghar S.; and Hauptmann, Eric A., 3,959,786.

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Roden, Martin Joseph; and Shaw, Frederick William, to Imperial Chemical Industries Limited. Yarn texturing. 3,958,407, Cl. 57-157.0TS.

Rodinsky, Theodore F. Fire extinguishing mattress cover. 3,958,286, Cl. 5-335.000.

Rodler, Hans. Apparatus for treatment with sum currents. 3,958,577, Cl. 128-420.00A.

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Rogers, Charles W. Filamentary tape constructions and methods. 3,959,544, Cl. 428-109.000.

Rogers, Francis Elliot, to Du Pont de Nemours, E. I., and Company. Melt-fusible linear polyimide of 2,2-bis(3,4-dicarboxyphenyl)-hexafluoropropane dianhydride. 3,959,350, Cl. 260-47.00C.

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Rohde, Wolfgang; Rotter, Friedrich; and Muller, Adolf, to Schloemann-Siemag Aktiengesellschaft. Longitudinal shear. 3,958,480, Cl. 83-237.000.

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Rolker, John H.; and Glasner, Thomas C., to Bell & Howell Company. Method of modifying polymers and novel product. 3,959,231, Cl. 260-75.00T.

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Rolls-Royce (1971) Limited: *See—*
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Roschuk, John; and Holden, Merrick. Method employing D.C. pulses for the detection of disseminated or massive mineralization within the earth crust by producing an A.C. electromagnetic field. 3,959,721, Cl. 324-6.000.

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Aaen, Olav; Rose, Edgar; and Prince, Anthony, 3,958,461.

Rosen, Sidney. Speed control for pump of filling machines. 3,959,703, Cl. 318-305.000.

Rosenberg, Peretz. Spray nozzle. 3,958,760, Cl. 239-453.000.

Rosenblum, Ira: *See*—
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Rosendahl, Gottfried R.; and Mohon, Windell N., to United States of America, Navy. Composite polarized film for use in a weapon training simulator. 3,958,871, Cl. 352-39.000.

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Roth, Edwin H. Matchbook. 3,958,689, Cl. 206-104.000.

Roth, Johann, to Braun Aktiengesellschaft. Motion picture camera with electromagnetically actuated release. 3,958,872, Cl. 352-92.000.

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Rotter, Friedrich: *See*—
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Rotter, Gerhard; Buchan, William A.; and an der Heiden, Rainer, to BASF Aktiengesellschaft. Arrangements for time base error compensation. 3,959,815, Cl. 360-36.000.

Rough, Pierre: *See*—
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Rowe International Inc.: *See*—
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Rowland, Stanley P.; and Blouin, Florine A., to United States of America, Agriculture. Flame-resistant textiles through finishing treatments with vinyl monomer systems. 3,958,932, Cl. 8-115.700.

Rowley, William N.; and Ehret, Gordon F., to Weil-McLain Co., Inc. Fluid pumping assembly of a molded synthetic material. 3,958,894, Cl. 415-53.00R.

Royal Business Machines, Inc.: *See*—
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Rusbach, Maurice, to Sarmac S.A. Ball-and-socket joint. 3,958,904, Cl. 403-90.000.

Rusby, Joseph V. Tide-powered electrical generator. 3,959,663, Cl. 290-53.000.

Rusche, Christian: *See*—
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Sadamatsu, Shigeru; Kaneko, Hiroyuki; Ohe, Keitaro; and Nishio, Daijiro, to Fuji Photo Film Co., Ltd. Manufacturing method for electrophotographic developing agent. 3,959,153, Cl. 252-62.10P.

Sagara, Hiroji: *See*—
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St. Croix Corporation: *See*—
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Saint-Remy Pellissier, Charles Marc Marie, to Societe Anonyme Fondasol-Technique. Penetrometer frames. 3,958,646, Cl. 173-44.000.

Saito, Masao; Onozawa, Mamoru; and Kawakami, Takamasa, to Mitsubishi Gas Chemical Company, Inc. Process for producing aromatic nitriles. 3,959,339, Cl. 260-465.00C.

Saitoh, Takeshi: *See*—
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Sakaida, Roy R.: *See*—
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Sakurai, Yoshikuni, to Sakurai Seisakusho, Ltd. Device for positioning an object to be printed in a printing machine. 3,958,508, Cl. 101-407.0BP.

Salihi, Jalal Tawfiq. Direct current motors with improved commutation. 3,959,705, Cl. 318-439.000.

Salmond, William G., to Upjohn Company, The. Process and compounds. 3,959,320, Cl. 260-397.200.

Salts, Thomas R., to Crowe-Gulde, Inc. Apparatus for packaging concrete brick. 3,958,506, Cl. 100-4.000.

Salutsky, Murrell Leon: *See*—
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Salyer, Ival O.; Schwendeman, James L.; and Jefferson, Robert T., to Monsanto Research Corporation. Use of solvent mixtures in making foamable compositions. 3,959,197, Cl. 260-2.50E.

Samour, Carlos M.; and Richards, Mildred C. Monomeric emulsion stabilizers derived from alkyl/alkenyl succinic anhydride. 3,959,355, Cl. 260-482.00R.

Sand, Rudolf: *See*—
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Sander, Conrad. Apparatus for purifying exhaust gases containing ionizable and oxidizable components. 3,959,661, Cl. 250-531.000.

Sandera, Ladislav: *See*—
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Sasaki, Hiroo: *See*—
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Sassak, Frank. Universal tube bending machine. 3,958,440, Cl. 72-307.000.

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Satake, Jiro; Nagata, Saburo; and Kawasaki, Katsuyasu, to Sumitomo Metal Industries, Ltd. Method of producing aluminum coated steel. 3,959,030, Cl. 148-12.00R.

Sato, Kozo: *See*—
Suetsugi, Masao; Sato, Kozo; Kobayashi, Juichi; and Nakamoto, Hideo, 3,959,521.

Sato, Masaru: *See*—
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Satow, Haruhiko; and Shimoji, Masaharu, to Toyo Kogyo Co., Ltd. Fuel injection type rotary piston engine. 3,958,539, Cl. 123-8.090.

Satzinger, Roland. Partially self-fastening, highly effective three-point safety belt for the occupants of vehicles. 3,958,812, Cl. 280-746.000.

Sauers, Marvin Edward, to Union Carbide Corporation. Method of warm runner injection molding phenolic resins with para-substituted phenol. 3,959,433, Cl. 264-328.000.

Sauter, Wolfgang Juergen: *See*—
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Scalera, Frank T., to Rowe International Inc. Door operating assembly for merchandising machine or the like. 3,958,821, Cl. 292-97.000.

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Schaefer, Louis F., to Stanford Research Institute. Signal processing system and method. 3,959,732, Cl. 328-151.000.

Schaefer, Louis F., to Stanford Research Institute. Method and apparatus for error compensation in multichannel systems. 3,959,770, Cl. 340-146.10E.

Schaeffer, Bruce W., to Kirsch Company. Hanger cartridge for facilitating assembly of traverse rods. 3,958,691, Cl. 206-326.000.

Schafer, Wilhelm: *See*—
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Scheiber, Peter. Stereophonic sound system. 3,959,590, Cl. 179-1.0GQ.

Scheier, Donald Joseph; Haynes, Homer Augusta; Hawthorn, J. D.; and Frederick, Henry Evans, to Gordon Johnson Company. Method and apparatus for poultry vent removal. 3,958,303, Cl. 17-11.10R.

Schenck, Paula; Foster, Patricia L.; Walker, William W., Jr.; and Fogel, Samuel, to American Bioculture, Inc. Production of algal biopolymers. 3,958,364, Cl. 47-1.400.

Schenk, Peter, to Dzus Fastener Co., Inc. Method of making a spring wing stud. 3,958,321, Cl. 29-446.000.

Schenk, Wolfgang. Closure means for artificial rectal openings. 3,958,556, Cl. 128-1.00R.

Scherf, Adolf: *See*—
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Schering Aktiengesellschaft: *See*—
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Schill, Erwin. Method of drawing-in or flattening dents in sheet metal. 3,959,619, Cl. 219-50.000.

Schilling, Wolfgang: *See*—
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Schirmann, Jean-Pierre: *See*—
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Schirmer, Henry G., to W. R. Grace & Co. Fabric formed by heat sealing, shrinking and foaming backing. 3,959,051, Cl. 156-85.000.

Schlaffer, Walter G.: *See*—
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Schlaich, Helmut: *See*—
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Schmerling, Louis, to Universal Oil Products Company. Production of substituted aromatic compounds. 3,959,226, Cl. 260-671.00R.

Schmid, Louis H. Electrical connector pin. 3,958,859, Cl. 339-217.00S.

Schmidt, Ferenc J., to Ametek, Inc. Solar collector having oxygen-deficient PbO_2 coating. 3,958,554, Cl. 126-271.000.

Schmidt, Fritz: *See*—
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Schmied, Lothar, to Knorr-Bremse GmbH. Resiliently supported magnetic rail-brake suspension device. 3,958,669, Cl. 188-165.000.

Schmitt, Ernst: *See*—
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Schmitt, William C., to Milwaukee Faucets, Inc. Single lever faucet valve cartridge. 3,958,601, Cl. 137-636.200.

Schneble, Frederick W., Jr.; McCormack, John F.; and Zeblisky, Rudolph J., to Photocircuits Corporation. Improvements in electroless metal plating. 3,959,531, Cl. 427-345.000.

Schneider, Ewald, to Inventa AG fur Forschung und Patentverwertung, Zurich. Stabalization of linear polyesters. 3,959,215, Cl. 260-45.8NZ.

Schneider, Roger H.: *See*—
Lee, Thomas R.; Schneider, Roger H.; and Wyatt, John L., 3,959,653.

Schneider, William E.; and Sasse, John A., to United States of America, Navy. High pressure, 4-position, 5-way, pilot operated valve for corrosive media. 3,958,598, Cl. 137-596.180.

Schneider, William P., to Upjohn Company, The. Racemic prostaglandins of the 2-series and analogs thereof. 3,959,346, Cl. 260-468.00D.

Schnelle, Charles Wayne, to Tasope' Limited. Combined washer and dryer unit. 3,958,586, Cl. 134-68.000.

Schoeller Technical Papers Company: *See*—
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Schoeneberger, Ernest A., to Sperry Rand Corporation. Header attachment structure. 3,958,399, Cl. 56-15.800.

Schoenenberger, Richard J.: *See*—
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Schoepfle, Blaine O.: *See*—
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Schraven, Eckhard: *See*—
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Schregenberger, Alex J., to Midland-Ross Corporation. Conveyor system including article regrouping apparatus. 3,958,683, Cl. 198-22.00R.

Schriber, Stanley O., to Atomic Energy of Canada Limited. Intercoupled linear accelerator sections operating in the $2\pi/3$ mode. 3,959,687, Cl. 315-5.420.

Schrick, Richard I.: *See*—
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Schrock, Wilfried: *See*—
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Schubart, Rolf, to Dorst-Keramikmaschinen-Bau Inh. Otto Dorst u. Dipl.-Ing. Walter Schlegel. Device for the production of ceramic mouldings, and more especially of magnetized ferrite mouldings. 3,958,908, Cl. 425-84.000.

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Schuhmann, Bernd: *See*—
Hiersig, Heinz M.; Schafer, Wilhelm; Schuhmann, Bernd; and Thiemann, Max, 3,958,465.

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Schwachhofer, Ghislain: *See*—
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Schwan, Thomas J., to Morton-Norwich Products, Inc. Methyl 1-(3,4-dichlorobenzyl)-2,3-dioxoisonipecotate. 3,959,293, Cl. 260-293.760.

Schwartz, Bertram, to Bell Telephone Laboratories, Incorporated. Electrolytic etching of III - V compound semiconductors. 3,959,098, Cl. 204-129.300.

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Schwelberger, Hubert: *See*—
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Schwendeman, James L.: *See*—
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Scibor-Rylski, Marek Tadeusz Victor. Electro-optical modulator. 3,958,862, Cl. 350-160.00R.

SCM Corporation: *See*—
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Scott, Eldred D., to Precision Sales Corporation. Adjustable feed mechanism. 3,958,737, Cl. 226-142.000.

Scott, James T.: *See*—
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Scott, John Hunt: *See*—
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Scott, Samuel C. Concrete wall forming panel with inflatable liner means. 3,958,790, Cl. 249-65.000.

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Searle, Malcolm John: *See*—
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Sears, Gustavus Warren. Keyboard attachments. 3,958,486, Cl. 84-464.000.

Sebag, Henri: *See*—
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Sebesi, Suzanne: *See*—
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Sederberg, George William: *See*—
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Seefluth, Charles L., to Phillips Petroleum Company. Method of transferring and aligning parisons using clamping jaws with offset tines. 3,959,426, Cl. 264-94.000.

Seifert, Jay A.; Hill, Donald R.; and Smith, Michael, to Dorr-Oliver Incorporated. Traction-driven composite sludge raking mechanism for sedimentation tanks. 3,959,152, Cl. 210-530.000.

Seipos, Andrew G.: *See*—
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Selz, John C. Collapsible wall container. 3,958,713, Cl. 220-6.000.

Semi, Inc.: *See*—
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Senda, Katsuyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Photoelectric breakerless distributor. 3,958,543, Cl. 123-117.00R.

Senor, Ronald E., to Texas Instruments Incorporated. Thermally responsive electrical switch. 3,959,762, Cl. 337-102.000.

Sentementes, Thomas J.; Castello, Eugene A.; and Coppola, Richard, to GTE Sylvania Incorporated. Method of coating photoflash lamp. 3,959,525, Cl. 427-185.000.

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Shalomeev, Andrei Stepanovich: *See*—
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Shanley, Robert Loren, II, to RCA Corporation. Set-up arrangement for a color television receiver. 3,959,811, Cl. 358-10.000.

Shannon, Edward L.: *See*—
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Sharp, Russell G.; Cooley, Denton A.; and Reed, Charles C., to Texas Medical Products, Inc. Coronary artery bypass graft testing device and method. 3,958,557, Cl. 128-1.00R.

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Shatila, Mounir A., to American Potato Company. Microbially-stable potato products and process. 3,959,501, Cl. 426-269.000.

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Sheehan, John M., to United States Steel Corporation. Heat treatment for minimizing crazing of hot-dip aluminum coatings. 3,959,035, Cl. 148-134.000.

Sheldon, Robert S.; and Whitten, David E., to Air-Dry Corporation. Remote sensing regulator and shutoff valve for valve manifolds. 3,958,599, Cl. 137-613.000.

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Shibata, Yoshiki; Fujino, Hisami; Harano, Sigeki; and Kakigami, Hideo, to Toray Industries, Inc. Method and apparatus for determining total oxygen demand of combustible materials in aqueous dispersion. 3,958,937, Cl. 23-230.0PC.

Shigemori, Hideto; and Fukunaga, Motoaki, to Glory Kogyo Kabushiki Kaisha. Money dispenser. 3,958,583, Cl. 133-4.00R.

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Shimabara, Tatsutoshi: *See*—
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Shimada, Hisahiko: *See*—
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Shimoji, Masaharu: *See*—
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Shimomura, Naonobu. Barometric altimeter. 3,958,459, Cl. 73-384.000.

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Shimp, Alan B., to Westinghouse Electric Corporation. Circuit interrupter with ground fault trip control. 3,959,695, Cl. 317-33.00R.

Shin Nisso Kako Co., Ltd.: *See*—
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Shinoda, Kazuo; and Koide, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Air-fuel ratio control device in an internal combustion engine. 3,958,544, Cl. 123-119.0DB.

Shionogi & Co., Ltd.: *See*—
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Shoji, Mituhiro: *See*—
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Showa Denko Kabushiki Kaisha: *See*—
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Shriver, Joe E., to Sperry-New Holland Sperry Rand Corporation. Cutterhead rotating mechanism for forage harvester. 3,958,766, Cl. 241-101.200.

Shuster, Edward J.: *See*—
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Sibley, Henry C., to General Signal Corporation. Shunt enhancement logic circuit. 3,958,782, Cl. 246-40.000.

Sibley, Henry C.; and Smith, Willis R., to General Signal Corporation. Four terminal varistor. 3,959,763, Cl. 338-21.000.

Siedenstrang, Roy W., to Phillips Petroleum Company. Unvulcanized expanded high green strength synthetic rubber product and method of manufacture. 3,959,545, Cl. 428-141.000.

Siemen AG: *See*—
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Penczynski, Peter; Jacobsen, Peter; Matthaus, Gunther; and Masek, Peter, 3,959,549.
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Siewert, Robert M., to General Motors Corporation. Staged internal combustion engine with interstage temperature control. 3,958,540, Cl. 123-59.0EC.

Sigmaform Corporation: *See—*
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Signetics Corporation: *See—*
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Sigott, Siegfried; and Schwelberger, Hubert, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Drum mining head with cutter pattern. 3,958,832, Cl. 299-89.000.

Silveira, Robert J., Jr., to United States of America, Navy. Modified circuit card extender. 3,958,858, Cl. 339-186.00M.

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Singh, Jaswant, to Galson Technical Services, Inc. Methods for removing fluoborates from aqueous media. 3,959,132, Cl. 210-45.000.

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Singleton, Henry M., to Southland Corporation, The. High molecular weight butadiene-styrene latex can end sealant composition. 3,959,206, Cl. 260-29.6RW.

Sinko Kogyo Co., Ltd.: *See—*
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Sittmann, Brigitte, to Vereinigte Baubeschlagfabriken Gretsch & Co. GmbH. Safety ski binding with sole plate. 3,958,811, Cl. 280-618.000.

Sittner, Edward, to Sittner Manufacturing Co., Inc. Oil and insecticide dispensing apparatus for livestock. 3,958,537, Cl. 119-157.000.

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Slanik, Josef Milan, to Bobtex Corporation Limited, The. Textile apparatus and process. 3,959,055, Cl. 156-167.000.

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Smejda, Richard K. Pinstripe application systems. 3,958,533, Cl. 118-411.000.

Smetana, Richard D., to Texaco Inc. Preparation of 1,2-dihydroxy compounds. 3,959,393, Cl. 260-621.00G.

Smith, Alexander Sutherland: *See—*
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Smith, Cecil R., Jr.: *See—*
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Smith, David: *See—*
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Smith, David W. Three wheeled vehicle. 3,958,814, Cl. 280-269.000.

Smith, Donald Cameron, to Sperry Rand Corporation. Digital signal multiplexer/concentrator. 3,959,595, Cl. 179-15.0BA.

Smith, Donnie M.: *See—*
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Smith, Francis Hughes, to Vickers Limited. Interferometric apparatus. 3,958,884, Cl. 356-106.00R.

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Smith, Jesse J. Means and method for producing plastic netting. 3,959,057, Cl. 156-244.000.

Smith, John R.: *See—*
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Smith, Michael: *See—*
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Smith, Richard E.; and Bresnick, Herbert L., to Xerox Corporation. Electrostatic processor having interchangable reservoirs for supplying and reclaiming toner. 3,958,878, Cl. 355-15.000.

Smith, Richard L., Jr.; and Johns, Joseph W., Jr. Defoamer containing liquid polybutene. 3,959,175, Cl. 252-321.000.

Smith, Trevor Stanley, to Joseph Lucas (Industries) Limited. Control valve arrangement for gas turbine engine fuel supply system. 3,958,414, Cl. 60-39.28R.

Smith, William Andrew; and Moyer, Richard Eugene, to Procter & Gamble Company, The. Reclosable carton. 3,958,748, Cl. 229-51.0TC.

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Societe Anonyme dite: Hexachime: *See—*
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Societe Nationale des Petroles d'Aquitaine: *See—*
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Solomon, James E.; and Russell, Ronald W., to National Semiconductor Corporation. Differential amplifier. 3,959,733, Cl. 330-30.00D.

Somov, Boris Stepanovich; Mamin, Alexandr Ilich; Novikov, Andrei Porfirievich; Filippov, Vyacheslav Ivanovich; Khirdzhiev, Sergei Grigorievich; Gurevich, Vladimir Zakharovich; Voronov, Nikolai Stepanovich; and Agafonov, Ivan Fedorovich. Apparatus for bending pipes with heating of the bending zone. 3,958,438, Cl. 72-128.000.

Sone, Isamu: *See—*
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Sonetaka, Kazunori: *See—*
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Sonoyama, Takayasu; Tani, Hiroyoshi; Kageyama, Bunji; Kobayashi, Kobee; Honjo, Tahiko; and Yagi, Shigeo, to Shionogi & Co., Ltd. Process for producing 2-keto-L-gulonic acid. 3,959,076, Cl. 195-30.000.

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Sorensen, Robert; and Gordon, Paul C., to International Harvester Company. Sickle bar mower mounting apparatus. 3,958,400, Cl. 56-12.600.

Sousa, Henry P., to Arlington Trust Company. Remotely programmable call diverter. 3,959,600, Cl. 179-18.0BE.

Southgate, Robert: *See—*
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Spanelis, Evangelos L. Unitary pedal apparatus for selectively accelerating and braking a vehicle. 3,958,677, Cl. 192-3.00R.

Speaker, Tully J.; and Lesko, Lawrence J., to Temple University. Microparticulate material and method of making such material. 3,959,457, Cl. 424-19.000.

Specht, Dieter; and vom Stein, Hans, to Interrol Fordertechnik GmbH & Co. KG. Adjustable coding reflector. 3,959,629, Cl. 235-61.12N.
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Spiecens, Camil P. Method and apparatus for interpreting binary data. 3,959,816, Cl. 360-44.000.
Spier, I. Martin. Outer shell construction for boot and method of forming same. 3,958,291, Cl. 12-142.0RS.
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Splitt, Hans-Richard; and Scherf, Adolf, to Mannesmann Aktiengesellschaft. Multiple chamber heating unit. 3,958,921, Cl. 432-122.000.
Squier, William H., to M. Lowenstein & Sons, Inc. Three dimensional decorative material and process for producing same. 3,959,434, Cl. 264-45.800.
Squire, Christopher John: *See*—
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Srivastava, Dinesh K., to GTE Automatic Electric Laboratories Incorporated. Arrangement and method for the localized self-control of randomly allotted time slots to audio ports. 3,959,594, Cl. 179-15.0AQ.
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Stahle, Martin. Automatic volume control for centrifugal pumps. 3,958,723, Cl. 222-282.000.
Staker, Walter Lyman, to United States of America, Interior. Decomposition of chalcopyrite. 3,958,983, Cl. 75-101.00R.
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Stanek, Mark J., to Sigmaform Corporation. Wrap around heat shrinkable article. 3,959,052, Cl. 156-86.000.
Stanfield, James S.; and Trester, Paul W. Apparatus and method for repairing elongated flexible strips having damaged sprocket feed holes along the edge thereof. 3,959,048, Cl. 156-94.000.
Stanford, James R.; and Chappell, George D., to Nalco Chemical Company. High temperature corrosion inhibitor for gas and oil wells. 3,959,158, Cl. 252-8.55E.
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Stangl, Georg, to Hoechst Aktiengesellschaft. Cooling device for tubular sheeting. 3,958,913, Cl. 425-445.000.
Staniland, Philip Anthony; and Jarrett, Graham, to Imperial Chemical Industries Limited. Irradiated aromatic polysulphones of increased flow resistance and molecular weight. 3,959,101, Cl. 204-159.110.
Stankiewicz, Jerzy G. Rapid transit system. 3,958,512, Cl. 104-20.000.
Stanton, George E., to Bendix Corporation, The. Heat shield and drive key apparatus for disc brake. 3,958,833, Cl. 301-6.00A.
Stapler, John T.; and Bornstein, Joseph, to United States of America, Army. Polyamide from hexahydrobenzodipyrrole. 3,959,232, Cl. 260-78.00R.
Starkie, Raymond Denis, to Distillers Company (Yeast) Limited, The. Active dried yeast composition. 3,959,494, Cl. 426-19.000.
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Steinberg, Jack: *See*—
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Steinberg, Meyer, to United States of America, Energy Research and Development Administration. Electrolytic synthesis of methanol from CO_2. 3,959,094, Cl. 204-77.000.
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Stephen, George A., Jr. Electric barbecue grill. 3,959,620, Cl. 219-386.000.
Stephens, Charles W., to Martin Marietta Corporation. Battery charger having fast charge rate and high reliability. 3,959,707, Cl. 320-39.000.
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Sternberg, Jacob; and Freund, Robert W., to Veripen, Inc. Method and apparatus for recording a signature. 3,959,769, Cl. 340-146.3SY.
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Stewart, Alice. Three-dimensional stitchery ornaments. 3,959,535, Cl. 428-5.000.
Stewart, Karen L., to Ford Motor Company. Stoichiometric air/fuel ratio exhaust gas sensor. 3,959,765, Cl. 338-34.000.
Stewart, Sherman A.; Snyder, Estel R.; and Ruff, David L., to Grefco, Inc. Twin membrane, self sealing, mechanically fastened insulated roof deck system. 3,958,373, Cl. 52-58.000.
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Stiles, Edward. Mobile rock collecting and crushing. 3,958,767, Cl. 241-101.700.
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Stoepel, Kurt: *See*—
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Striker, David L., to Ford Motor Company. Alternator rectifier bridge and method of assembly. 3,959,676, Cl. 310-68.00D.
Strobel, Albert; and Robins, Charles T., to I-T-E Imperial Corporation. Narrow multi-pole circuit breaker having bodily movable instantaneous trip structure. 3,959,752, Cl. 335-10.000.
Strohbach, John W.; Williams, Robert M.; Edwards, Jeffrey D.; and Newcomer, Christopher B., to Kroger Company, The. Method and system for producing a soft food product. 3,959,513, Cl. 426-565.000.
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Subramanian, Sundaram, to Zenith Radio Corporation. Dual sidestepping SWIF and method. 3,959,748, Cl. 333-72.000.
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Sugahara, Eisuke; Uehara, Shigeo; Sugizaki, Yoshihiro; and Uchida, Yasuo, to Nippon Piston Ring Co., Ltd. Means of supplying control air to an inflatable member of a torque control means. 3,958,681, Cl. 192-88.00B.
Sugar, Joseph, to American Safety Equipment Corporation. Lock bar assembly for emergency safety belt retractor. 3,958,773, Cl. 242-107.40R.
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Sumida, Tokunobu, to Mitsui Mining & Smelting Co., Ltd. Apparatus for continuously manufacturing endless lead sheet. 3,958,622, Cl. 164-276.000.
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Swerlick, Isadore, to Du Pont de Nemours, E. I., and Company. Process for preparing high barrier, heat-sealable packaging film. 3,959,526, Cl. 427-209.000.
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Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha. Method of producing interlocking elements for slide fasteners. 3,959,430, Cl. 264-157.000.
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Takenaka, Shigeo; Kido, Yasuji; Shimabara, Tatsutoshi; and Ogawa, Masanobu, to Nippon Kayaku Kabushiki Kaisha. Oxidation catalyst and process for oxidation of olefins to unsaturated aldehydes. 3,959,384, Cl. 260-604.00R.

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Takino, Yoshinori, to Coca-Cola Co., The. Enzymatic solubilization of tea cream. 3,959,497, Cl. 426-52.000.

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Tanco, Juan J., to Westinghouse Electric Corporation. System and method for operating a steam turbine with digital computer control having improved automatic startup control features. 3,959,635, Cl. 235-151.100.

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Tateno, Hidenori; Nagai, Takanori; and Kurosaka, Sadao, to Toyota Judosha Kogyo Kabushiki Kaisha; and Toyota Motor Sales Company, Limited. Carburetor. 3,959,417, Cl. 261-39.00B.

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Taylor, Paul Franklin. Process for copper metal ore reduction. 3,958,978, Cl. 75-21.000.

Tchobanoglous, George, to SWECO, Inc. Method and apparatus for the activated sludge treatment of wastewater. 3,959,124, Cl. 210-6.000.

Teach, Eugene G., to Stauffer Chemical Company. Certain 3-haloacyl-2,2,5-trimethyl-oxazolidines. 3,959,304, Cl. 260-307.0FA.

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Teague, James E. Fuel injectors. 3,958,545, Cl. 123-139.0AJ.

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Thiem, Karl-Werner; Auge, Wolfgang; and Neeff, Rutger, to Bayer Aktiengesellschaft. Process for the preparation of 1-nitroanthraquinone. 3,959,317, Cl. 260-369.000.

Thiemann, Max: *See—*
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Thominet, Michel Leon, to Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France. Methods of protection against emesis in mammals by administration of a heterocyclic benzamide. 3,959,477, Cl. 424-274.000.

Thompson, David E., to Thompson Tool Co., Inc., The. Rotary scraper. 3,958,294, Cl. 15-198.000.

Thompson, David L.; and Headrick, Edward E., to Thompson Tank Manufacturing Company. Vortex cleaner and method of cleaning. 3,959,010, Cl. 134-21.000.

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Thornton, Ernest R. Jumping hoop. 3,958,802, Cl. 272-74.000.

Thornton, Roy F., to General Electric Company. Battery casing. 3,959,011, Cl. 136-6.0FS.

Thorsen, Gunnar. Process for recovery of zinc values from zinc waste. 3,958,986, Cl. 75-120.000.

Thyssen, Nicolaas Josephus Willibrordus, to Hoogovens Ijmuiden B.V. Method of operating a battery of coke ovens. 3,959,082, Cl. 201-1.000.

Tifft, William C. Adjustable drop or riser nipple. 3,958,819, Cl. 285-302.000.

Tillac, Jean-Francois: *See—*
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Timoney, Seamus Gearoid. Directed atomized fuel jet apparatus. 3,958,759, Cl. 239-434.000.

Timson, William J., to Polaroid Corporation. Coating apparatus. 3,958,532, Cl. 118-325.000.

Tipton, William C.; Suchomel, Michael; and Taran, John Z., to General Signal Corporation. Ionization-type fire detector. 3,959,788, Cl. 340-237.00S.

Todd, Alexander Henry: *See—*
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Todd, Lee T., Jr., to Massachusetts Institute of Technology. Cathodochromic CRT projection display. 3,959,584, Cl. 178-7.880.

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Tokushige, Hiroyuki; Kosaki, Akira; and Sakai, Tadamoto, to Japan Steel Works, Ltd. Method for continuously thermally decomposing synthetic macro-molecule materials. 3,959,357, Cl. 260-486.00R.

Tokyo Plywood Kabushiki Kaisha: *See—*
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Torisu, Yasuyoshi; Kaba, Seishichiro; and Mukai, Ken, to Mitsui Toatsu Chemicals, Incorporated. Process for preparing highly pure 5-nitro-1,4,4a,9a-tetrahydroanthraquinone. 3,959,318, Cl. 260-369.000.

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Touchette, John W., to Goodyear Tire & Rubber Company, The. Tire building drum. 3,959,064, Cl. 156-417.000.

Townsend, Richard E., to Fairchild Industries Inc. Aircraft control system with a jam isolating coupling. 3,958,779, Cl. 244-75.00R.

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Trapasso, Louis E., to Celanese Corporation. Production of 4-halo-2-alkenyl tri-lower alkyl ammonium or phosphonium halides. 3,959,376, Cl. 260-567.60M.

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Trehn, Karl Bengt I:son; and Swahn, Nils Henrik. Service purchasing system. 3,959,632, Cl. 235-92.0AC.

Tremblay, Raymond M., to USM Corporation. Staple gun for accommodating a range of staple sizes. 3,958,738, Cl. 227-109.000.

Trenary, John; Smith, David; Ruehmann, Donald W.; Elkins, Christopher W.; Erwin, Elmer; and Treadwell, Roy, to Teledyne Water Pik. Spray nozzles. 3,958,756, Cl. 239-102.000.

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Tsuda, Naokatsu, to Furukawa Electric Co., Ltd., The. Method for manufacturing lead grid plates for batteries. 3,959,016, Cl. 136-67.000.

Tsuji, Waichiro; Nakajima, Akio; and Hosono, Masao, to Kyoto University. Polyelectrolyte composite of polyvinyl alcohol derivatives. 3,959,406, Cl. 260-874.000.

Tsukamoto, Akira: *See—*
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Turner, Ralph William: *See—*
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Turro, Jerome C., to Lawrence Peska Associates, Inc., a part interest. Incense lamp. 3,959,642, Cl. 240-2.0LC.

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Valiant, Joseph W., II. Method for processing food products. 3,959,505, Cl. 426-393.000.

Van Assche, Daniel, to Sandoz Ltd. Water soluble nitro compounds. 3,959,332, Cl. 260-456.00A.

van der Lely, Cornelis. Methods for the manufacture of prefabricated building sections or room units and factories for the implementation of such methods. 3,958,320, Cl. 29-430.000.

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van Ginneken, Adriaan J. J., to Shell Oil Company. Reactor having a catalytic bed with upstream means for filtering solid contaminants. 3,958,952, Cl. 23-288.00R.

Vanlerberghe, Guy, to L'Oreal. Process of producing mono and polyhydroxyl ethers. 3,959,390, Cl. 260-615.00R.

Vanlergerghe, Guy; and Sebag, Henri, to L'Oreal. Cosmetic compositions containing anionic surface active agent containing mono- or polyhydroxylated mono- or poly ether chains and a terminal acid group. 3,959,460, Cl. 424-70.000.

Van Zon, Cornelis, to Industriele Onderneming Wavin N.V. Method for manufacturing a plastic tube. 3,959,427, Cl. 264-99.000.

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Vaughn, Howard A., Jr.; and Vodicka, Vincent, to General Electric Company. Method for rendering vitreous surfaces water repellant and dirt deposit resistant and articles produced thereby. 3,959,563, Cl. 428-429.000.

Vazopolos, Steve, to Monsanto Company. Process for preparing 1-hydroxy, ethylidene-1,1-diphosphonic acid. 3,959,360, Cl. 260-502.40A.

VCA Corporation: *See—*
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Vernaleken, Hugo; Weirauch, Kurt; Lenz, Gunther; and Hucks, Uwe, to Bayer Aktiengesellschaft. Process for the preparation of a bisphenol bischlorocarbonic acid ester. 3,959,335, Cl. 260-463.000.

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Vikhirev, Vitaly Viktorovich; Loktaeva, Valentina Vasilievna; Bronovsky, Grigory Abramovich; and Fasulati, Rady Kirillovich. Hydraulic machine. 3,958,896, Cl. 415-151.000.

Viking Industries, Inc.: *See—*
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Viramontes, Javier R. Method and apparatus for eliminating air flow in communications cables to assist in plug formation. 3,958,606, Cl. 138-97.000.

Vissers, Bastiaan; and Teunissen, Willem, to Expert N.V. Cooler-drier for castings and moulding sand. 3,958,623, Cl. 164-412.000.

Vitous, Charles J., to Cory Food Services, Inc. Beverage brewer. 3,958,502, Cl. 99-300.000.

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von der Eltz, Hans-Ulrich; Kloss, Egbert; and Kohler, Hartwig, to Hoechst Aktiengesellschaft. Process for the continuous dyeing of high quality polyester fibers. 3,958,288, Cl. 8-149.100.

von Roesgen, Charles Alphonse, to Bell Telephone Laboratories, Incorporated. Digital bit stream synchronizer. 3,959,589, Cl. 178-69.50R.

von Schmeling, Bogislay: *See—*
Davis, Robert A.; von Schmeling, Bogislay; Felauer, Ethel E.; and Kulka, Marshall, 3,959,481.

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von Strandtmann, Maximilian: *See—*
Kaminsky, Daniel, deceased; Klutchko, Sylvester; and von Strandtmann, Maximilian, 3,959,480.

Vora, Bipin V.: *See—*
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Wafer, John A., to Westinghouse Electric Corporation. Circuit interrupter with load side short circuit. 3,959,753, Cl. 335-16.000.

Waggoner, Marion Glen, to Du Pont de Nemours, E. I., and Company. Coating material of polymers and salts of fatty acids. 3,959,539, Cl. 428-35.000.

Wagman, Gerald H.: *See—*
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Wagner, Delmer W. Lumber moisture measurement apparatus which is less sensitive to lumber movement and spacing. 3,959,723, Cl. 324-61.00P.

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Wajs, Georges; and Lenne, William, to Essilor International (Compagnie Generale d'Optique S.A.). Method for preparing a crosslinked graft copolymer of silicone and polyvinylpyrrolidone for use as a contact lens, and a contact lens produced thereby. 3,959,102, Cl. 204-159.130.

Wakako, Atsuhiro: *See—*
Inoi, Yoshio; Fukuda, Takeyuki; Hyoudou, Kouji; and Wakako, Atsuhiro, 3,958,435.

Wakasa, Yutaka; Uchiike, Hisayuki; Kataoka, Koju; and Takiura, Yasuro, to Yokogawa Electric Works, Ltd. Two-wire signal transmission system. 3,959,772, Cl. 340-167.00A.

Wakimasu, Mitsuhiro: *See—*
Nakajima, Nobuo; Aoki, Hisashi; Fujino, Masahiko; Nishimura, Osamu; Wakimasu, Mitsuhiro; and Mano, Mitsuhiko, 3,959,245.

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Arashi, Masanori; Shimada, Hisahiko; Fujituka, Shigeyuki; Kamiya, Kimio; and Miyazaki, Tomoyuki, 3,959,343.

Walia, Gurbinder Singh; and Smith, Alexander Sutherland, to Northern Electric Company Limited. Ratchet type handle for crimping tool and the like. 3,958,442, Cl. 72-410.000.

Walker, Michael Edward; and Wooding, Peter Timothy, to C.A.V. Limited. Electric machines. 3,959,672, Cl. 310-36.000.

Walker, William W., Jr.: *See—*
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Wallace-Murray Corporation: *See—*
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Wallberg, Eric V.: *See—*
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Johansson, Lennart J. I.; Lindqvist, Bjorn W.; and Wallberg, Eric V., 3,958,550.

Walles, Wilhelm E., to Dow Chemical Company, The. Transparent astatic resinous articles and method for their production. 3,959,561, Cl. 428-412.000.

Wallin, Bengt Johan, to Volvo Flygmotor Aktiebolag. Control device for hydraulic machines. 3,958,496, Cl. 91-506.000.

Walsh, Edward George, to Bell Telephone Laboratories, Incorporated. Electrical circuit protection apparatus. 3,959,694, Cl. 317-18.00R.

Walsh, Edward N.: *See—*
Shim, Kyung S.; and Walsh, Edward N., 3,959,414.
Shim, Kyung S.; and Walsh, Edward N., 3,959,415.

Walt, Hans, to Keller AG Ziegeleien. Anchor for interconnecting two relatively movable components of a structure. 3,958,382, Cl. 52-713.000.

Walther & Cie Aktiengesellschaft: *See—*
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Waltmann, Ernst: *See—*
Fennekels, Peter; and Waltmann, Ernst, 3,958,926.

Wanat, Robert R., to Teletype Corporation. Method and apparatus for detecting paper drive malfunctioning in an automatic printer. 3,958,735, Cl. 226-1.000.

Ward, Dennis H. Relating to containers. 3,958,719, Cl. 220-288.000.

Warkentin, Brian T., to Shade Foods, Inc. Process for producing a solid chocolate composition suitable for coating ice cream. 3,959,516, Cl. 426-631.000.

Warne, Carter J., to Ciba-Geigy Corporation. Adjustable endless band doctor. 3,958,531, Cl. 118-101.000.

Warner, Amos C.; and Williams, Chalmes V., to Cities Service Company. Carbon black. 3,959,008, Cl. 106-307.000.

Warner-Lambert Company: *See—*
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Warren, Joe Edward: *See—*
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Warwick, Peter Stephen: *See—*
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Washio, Takaji; Nakajima, Tadanobu; Miyoshi, Hideo; Yoshioka, Masahiro; and Aizawa, Tatsuo, to Mita Industrial Company, Ltd. Copying machine of the diazo type. 3,958,880, Cl. 355-106.000.

Watanabe, Sosuke, to Hitachi Chemical Company, Ltd. Water discharge device for use with irrigation systems. 3,958,761, Cl. 239-542.000.

Waters Associates, Incorporated: *See—*
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Waters, James L.: *See—*
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Watson, Lewis Ainsley: *See—*
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Watson, William Stanley, to United States of America, Navy. High current pulser circuit. 3,959,671, Cl. 307-270.000.

Watts, John Conway, to Du Pont de Nemours, E. I., and Company. Process for leaching sulfide minerals. 3,959,436, Cl. 423-27.000.

Watts, John D. Surface finishing and plating method. 3,959,089, Cl. 204-26.000.

Watts, Lewis William, Jr., to Jefferson Chemical Company, Inc. N-acetyl l-polychlorobenzamide compounds. 3,959,370, Cl. 260-558.00D.

Watts, William A.; and Pierce, Warren K., to Goodyear Tire & Rubber Company, The. Silane grafted poly(vinyl alcohol) film. 3,959,242, Cl. 526-9.000.

Weaving, John Harold; Haynes, Cecil David; and Caulton, John Edward, to British Leyland Motor Corporation Limited. Catalytic device for an exhaust system for an internal combustion engine. 3,958,312, Cl. 29-157.00R.

Webb, Godfrey Basil: *See—*
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Weber, Charles A.; and Lundgreen, Michael W., to Rockwell International Corporation. Digital hysteresis circuit. 3,959,730, Cl. 328-63.000.

Weber, Gunter: *See—*
Rick, Manfred; Busch, Rolf; Renz, Klaus; Weber, Gunter; Mann, Werner; Schlaich, Helmut; Rohm, Ernst; Luders, Rudeger; and Wilhelm, Manfred, 3,958,325.

Weber, Helmut E.: *See—*
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Weber, Kurt, to Ciba-Geigy AG. Cyano-distyrylbenzenes. 3,959,340, Cl. 260-465.00K.

Weber, Robert E.; and Peterson, Richard M., to Kimberly-Clark Corporation. Method for rapid quenching of melt blown fibers. 3,959,421, Cl. 264-6.000.

Webster Spring Co. Inc.: *See—*
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Wehling, Rolf, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Open-end spinning unit with fiber guide disc. 3,958,403, Cl. 57-58.890.

Weidner, Helmut; and Landgraf, Helmut, to Mannesmannrohren-Werke AG. Quench-hardening of pipes. 3,958,796, Cl. 266-123.000.

Weil-McLain Co., Inc.: *See—*
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Weinshenker, Ned M., to Dynapol. Insoluble oxidation reagent. 3,959,190, Cl. 260-2.5HB.

Weinstein, Marvin J.; Wagman, Gerald H.; Testa, Raymond T.; and Marquez, Joseph A., to Schering Corporation. Antibiotic G-418 and the production thereof. 3,959,254, Cl. 260-210.0AB.

Weir, Michael Joseph: *See—*
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Weirauch, Kurt: *See—*
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Weiss, Francis: *See—*
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Welber, Benjamin: *See—*
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Welch, Cletus N.: *See—*
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Weldes, Helmut Hans Wilhelm, to Philadelphia Quartz Company. Preparation of alkali metal and quaternary nitrogen double salts of silicic acid. 3,959,274, Cl. 260-247.70L.

Welex, Incorporated: *See—*
Nissel, Frank R., 3,959,431.

Weller, Robert W. Toggle wrench having pressure calculator means. 3,958,468, Cl. 81-368.000.

Wells, Richard E.; Derval, Victor E.; and Muchow, John D., to Willis Oil Tool Co. Safety shut-off valve. 3,958,592, Cl. 137-315.000.

Welter, Leonard M., to American Optical Corporation. Electron microscope. 3,959,651, Cl. 250-310.000.

Wentorf, Robert H., Jr., to General Electric Company. Transport of heat as chemical energy. 3,958,625, Cl. 165-2.000.

Wesselink, Gustaaf Adolf; Koelewijn, Arie; and Roelofs, Hendrik, to U.S. Philips Corporation. Electric lamp. 3,959,682, Cl. 313-217.000.

West, Charles W.: *See—*
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Westinghouse Electric Corporation: *See—*
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Crews, Roy E.; and Legg, Eugene D., 3,958,824.
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Herbert, Roger B., 3,959,698.
Isaacs, Thelma J.; and Gottlieb, Milton, 3,958,863.
Mrenna, Stephen A., 3,959,754.
Rhoton, Richard S., 3,958,783.
Shimp, Alan B., 3,959,695.
Tanco, Juan J., 3,959,635.
Wafer, John A., 3,959,753.
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Wetherill, William H.: *See—*
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Wetzel, Donald A., to Westinghouse Electric Corporation. Monitor and controller for heating a resistive element. 3,959,692, Cl. 317-13.00B.

Whatley, Houston A., Jr.: *See—*
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White, Harold R.; and Doncer, Alexander J., to Alar Engineering Corporation. Waste treatment process. 3,959,129, Cl. 210-28.000.

Whitener, Kevin F. Fish package and mode of use thereof. 3,958,393, Cl. 53-37.000.

Whiteside, Roger B.; and Long, Harry T., Jr., to Standard Pressed Steel Co. Riveted joint. 3,958,389, Cl. 52-758.00D.

Whitten, David E.: *See—*
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Wicker, Charles David; Tucher, Donald Louis; and Christie, Charles Dewey, to Wallace-Murray Corporation. Weld centering workpiece holder. 3,958,739, Cl. 228-44.10R.

Wicker, Thomas H., Jr.: *See—*
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Widder, James Stone: *See—*
Agricola, Francis Oswald; Briner, William Watson; Granger, Robert James; and Widder, James Stone, 3,959,458.

Widmer, Dieter, to Spindle-Motoren-und Maschinenfabrik A.G. Textile spindle. 3,958,405, Cl. 57-135.000.

Widmer, Dieter, to Spindel-Motoren-und Maschinenfabrik A.G. Spinning spindle assembly. 3,958,843, Cl. 308-152.000.

Wieland, Dieter: *See—*
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Wiesbock, Josef: *See—*
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Wikdahl, Nils Anders Lennart. Hydrocyclone separator unit with downflow distribution of fluid to be fractionated and process. 3,959,123, Cl. 209-211.000.

Wilbur, Charles J., to Quaker Oats Company, The. Special shipping case for elimination of cut container contents. 3,958,746, Cl. 229-38.000.

Wild Heerbrugg Aktiengesellschaft: *See—*
Stockinger, Alfred; and Mainka, Joachim, 3,958,885.

Wilde, Sheldon L., to H-C Industries, Inc. Apparatus for forming closure inserts. 3,958,910, Cl. 425-127.000.

Wiley, Corless W. Aspirator apparatus. 3,958,573, Cl. 128-276.000.

Wiley, Donald F., to Cosden Oil & Chemical Company. Coextrusion process. 3,959,432, Cl. 264-171.000.

Wilhelm, Denk. Process of manufacturing concrete moldings. 3,959,422, Cl. 264-23.000.

Wilhelm, Manfred: *See—*
Rick, Manfred; Busch, Rolf; Renz, Klaus; Weber, Gunter; Mann, Werner; Schlaich, Helmut; Rohm, Ernst; Luders, Rudeger; and Wilhelm, Manfred, 3,958,325.

Wilke, Robert N.: *See—*
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Wilkinson Sword Limited: *See—*
Horsler, Christopher; and Piercy, John, 3,959,160.

Will, Fritz G.; and Hess, Heinrich J., to General Electric Company. Battery casing and sealed primary sodium-halogen battery. 3,959,020, Cl. 136-86.00A.

William H. Rorer, Inc.: *See—*
Diamond, Julius; Douglas, George H.; and Burns, Bernard J., 3,959,488.

Williams, Chalmes V.: *See—*
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Williams, David Gordon: *See—*
Allport, Maurice James; and Williams, David Gordon, 3,959,708.

Williams, Harrison L.; and Banhidy, Detre M., to Preformed Line Products Company. Appliance for linear bodies. 3,958,379, Cl. 52-145.000.

Williams, John W., to Terminal Paper Bag. Co. Bottom forming device for a bag forming machine. 3,958,500, Cl. 93-27.000.

Williams, Robert M.: *See—*
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Willis Oil Tool Co.: *See—*
Wells, Richard E.; Derval, Victor E.; and Muchow, John D., 3,958,592.

Willis, Wilburn C.; Denhart, William L.; Kelly, Frank M.; and Clements, Joseph A., to Aluminum Company of America. Test apparatus for pressurized container and method. 3,958,448, Cl. 73-37.000.

Wilson, Farris H., Jr., to Goodyear Tire & Rubber Company, The. Phenolic phosphites as stabilizers for polymers. 3,959,221, Cl. 260-45.95D.

Wilson, Herbert L.: *See—*
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Gutierrez, William A.; and Wilson, Herbert L., 3,959,038.

Wilson, Robert Everett, to Viking Industries, Inc. Connector. 3,958,853, Cl. 339-99.00R.

Wimer, Scotty: *See—*
Putman, Edgar N.; Patterson, George; Wimer, Scotty; and McCool, John B., 3rd, 3,959,193.

Windheuser, John J., to Interx Research Corporation. Method of reducing intraocular pressure in warm-blooded animals. 3,959,485, Cl. 424-311.000.

Winkler, Gerhard: *See—*
Herrnring, Jorg: Tolksdorf, Wolfgang; Rusche, Christian; Mateika, Dieter; and Winkler, Gerhard, 3,959,006.

Winn, William D.; and Pollan, Johnney T., to Dow Chemical Company, The. Wood treating process. 3,959,529, Cl. 427-335.000.

Winyall, Milton E.; and Acker, Ellsworth G., to W. R. Grace & Co. Method of selectively producing high pore volume silica gel. 3,959,174, Cl. 252-317.000.

Wire, Philip J.; and Stephenson, James M. Pipe laying attachment. 3,958,704, Cl. 214-130.00C.

Wise, Phillip W.: *See—*
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Wismer, Marco: *See—*
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Wistar Institute, The: *See—*
Plotkin, Stanley A., 3,959,466.

Wittmann, Brigitte, nee Liebold; and Graffunder, Horst. Method to determine automatically the sequence of amino acids. 3,959,307, Cl. 260-309.500.

Witz, Samuel; and Hartung, Walter H., to Akzona Incorporated. Rapid identification of bacteria using chemiluminescence. 3,959,081, Cl. 195-103.50R.

Woebcke, Herman N.; and Kuo, Chi Sheng, to Stone & Webster Engineering Corporation. Convective power reformer equipment and system. 3,958,951, Cl. 23-288.00M.

Woldt, Gunter: *See—*
Heymann, Kurt; and Woldt, Gunter, 3,959,564.

Wolf, Alfred P.: *See—*
Ansari, Azizullah N.; Lambrecht, Richard M.; Redvanly, Carol S.; and Wolf, Alfred P., 3,959,455.

Wong, Johnson N. S. Vial assembly. 3,958,944, Cl. 23-259.000.

Woo, Gar Lok, to Chevron Research Company. Lime soap dispersant compounds. 3,959,334, Cl. 260-459.00R.

Wood, Hamish Christopher Swan; Stuart, Alexander; Curran, Adrian Charles Ward; and Al-Hassan, Saieba, to Burroughs Wellcome Co. Method of synthesis of pteridines. 3,959,278, Cl. 260-251.500.

Wood, Homer J., to Deere & Company. Centrifugal compressor with indexed inducer section and pads for damping vibrations therein. 3,958,905, Cl. 416-183.000.

Woodcock, Richard Forrest, to American Optical Corporation. Optical filter for neodymium laser light. 3,959,171, Cl. 252-300.000.

Wooding, Peter Timothy: *See—*
Walker, Michael Edward; and Wooding, Peter Timothy, 3,959,672.

Woods, David H.; and Anderson, Lawrence W., to Westinghouse Electric Corporation. Train vehicle protection apparatus including signal block occupancy determination. 3,958,781, Cl. 246-34.00R.

Woods, Wallace K., to United States of America, Energy Research and Development Administration. Method of operating a neutronic reactor. 3,959,070, Cl. 176-30.000.

World Oil Mining Ltd.: *See—*
Johns, Robert W., 3,958,830.

Wright, Basil Martin, to National Research Development Corporation. Ventilatory capacity measuring instrument. 3,958,565, Cl. 128-2.080.

Wright, John B.: *See—*
Hall, Charles M.; Johnson, Herbert G.; and Wright, John B., 3,959,289.

Wright, Michael: *See—*
Phillipps, Gordon Hanley; Lawrence, Robin; Newall, Christopher Earle; and Wright, Michael, 3,959,260.

Wunsch, Gerd: *See—*
Koester, Eberhard; Wunsch, Gerd; Deigner, Paul; Graw, Dieter; Uhl, Karl; and Steck, Werner, 3,959,032.

Wyatt, John L.: *See—*
Lee, Thomas R.; Schneider, Roger H.; and Wyatt, John L., 3,959,653.

Xerox Corporation: *See—*
Eddy, Clifford O.; Lentz, James A.; and Strella, Stephen, 3,959,573.
Hambling, Peter G.; Owen, Leslie W., deceased; Owen, Elizabeth Bertram, executrix; and Mould, George, executor, 3,959,109.

Kramer, William E., 3,958,989.
Menon, Sukumaran K.; and Guran, Zenon, 3,958,877.
Parent, Richard A., 3,958,990.
Seanor, Donald A.; Lentz, James A.; Eddy, Clifford O.; and Strella, Stephen, 3,959,574.
Smith, Richard E.; and Bresnick, Herbert L., 3,958,878.

Yagaki, Kazuhito: *See—*
Furuta, Isao; Yagaki, Kazuhito; and Masuda, Toshihiko, 3,959,441.

Yagi, Shigeo: *See—*
Sonoyama, Takayasu; Tani, Hiroyoshi; Kageyama, Bunji; Kobayashi, Kobee; Honjo, Tahiko; and Yagi, Shigeo, 3,959,076.

Yahagi, Masakichi; Horiuchi, Shoichi; Toyama, Takahumi; Kashiwagi, Akio; Suzuki, Teruo; Igaki, Tetsuo; Horisawa, Kazuyuki; and Shoji, Mituhiro, to Shin Nisso Kako Co., Ltd. Chromogenic fluoran derivatives and the preparation and use thereof. 3,959,571, Cl. 428-537.000.

Yamada, Shizuo; Sasaki, Hiroo; and Tanaka, Tetsuo, to Toyo Soda Manufacturing Co., Ltd. Process for producing 2-nitrocycloalkanones. 3,959,380, Cl. 260-586.00R.

Yamamoto, Kanji: *See—*
Uchida, Shigeru; and Yamamoto, Kanji, 3,958,874.

Yamamoto, Minoru: *See—*
Hayashi, Kiyoshige; Nakaniwa, Mikio; Yamamoto, Minoru; Ozaki, Kazuo; and Baba, Arimasa, 3,959,115.

Yamanashi, Chusaku: *See—*
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Yamanouchi Pharmaceutical Co., Ltd.: *See—*
Osono, Takashi; Moriyama, Kiruko; Murakami, Keisuke; and Umezawa, Hamao, 3,959,252.

Yamaoki, Hideo: *See—*
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Yamashita, Hiroyuki: *See—*
Urakami, Fukashi; Yamashita, Hiroyuki; and Aoki, Katsumi, 3,958,652.

Yamazaki, Kazuhiko; Saitoh, Takeshi; and Miura, Yoshio, to Hitachi, Ltd. Local oscillation circuit for tuner having reduced inter-channel deviation in AFC sensitivity. 3,959,728, Cl. 325-422.000.

Yan, Tsoung-Yuan: *See—*
Espenscheid, Wilton F.; and Yan, Tsoung-Yuan, 3,959,452.

Yanahara, Hiroshi: *See—*
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Yashica Co., Ltd.: *See—*
Takahashi, Makoto; and Ichihashi, Osamu, 3,959,791.

Yasuda, Teruaki: *See—*
Hukuba, Hiroshi; Ikegami, Iwao; and Yasuda, Teruaki, 3,958,297.

Yatagai, Shukuro; and Tamura, Katunori, to Japanese National Railways. Load-shifting cargo transfer apparatus. 3,958,701, Cl. 214-38.00C.

Yates, Paul C.: *See—*
Jayawant, Madhusudan D.; and Yates, Paul C., 3,959,445.

Yeakey, Ernest L.: *See—*
Brennan, Michael E.; and Yeakey, Ernest L., 3,959,374.

Yeh, Chuen Y.; and Ulmer, Harry E., to Allied Chemical Corporation. Method for reactivating palladium catalysts. 3,959,382, Cl. 260-586.00P.

Yoda, Naoya: *See—*
Aoyama, Toshikazu; Kimata, Yukinori; Okasaka, Hotuma; Kodama, Hiroshi; and Yoda, Naoya, 3,959,219.

Yoerger, William Edward: *See—*
Jones, Jean Elmore; and Yoerger, William Edward, 3,958,991.

Yokogawa Electric Works, Ltd.: *See—*
Wakasa, Yutaka; Uchiike, Hisayuki; Kataoka, Koju; and Takiura, Yasuro, 3,959,772.

Yokoi, Hideharu; Haginaka, Tetuo; Inagaki, Mitiji; and Moriguchi, Koei, to Fuji Chemical Industry Co., Ltd. Magnesium aluminosilicate and process for the manufacture thereof. 3,959,444, Cl. 423-328.000.

Yokota, Minoru: *See—*
Matsuda, Yoshio; Yokota, Minoru; Hanaki, Yoshie; and Sumitomo, Megumu, 3,959,027.

Yokota, Nobutoshi, to OHJI Seiki Kogyo Kabushiki Kaisha. Air extracting system for hydraulic steering apparatus. 3,958,420, Cl. 60-453.000.

Yoshida Kogyo Kabushiki Kaisha: *See—*
Takamatsu, Ikuo, 3,958,319.
Takamatsu, Ikuo, 3,959,430.

Yoshida, Masaharu, to Sunray Reinetsu Co., Ltd.; and Sumitomo Electric Industries, Ltd. Incinerator for oil-containing waste sludge and method thereof. 3,958,518, Cl. 110-7.00S.

Yoshida, Masakazu: *See—*
Nakashima, Hachiro; Miwa, Suichiro; Yanahara, Hiroshi; Yoshida, Masakazu; and Matsumoto, Minoru, 3,958,831.

Yoshikawa, Seikichi: *See—*
Tadokoro, Yukio; Shirai, Tadao; Sogabe, Satoshi; and Yoshikawa, Seikichi, 3,959,344.

Yoshioka, Masahiro: *See—*
Washio, Takaji; Nakajima, Tadanobu; Miyoshi, Hideo; Yoshioka, Masahiro; and Aizawa, Tatsuo, 3,958,880.

Yoshioka, Takao: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 3,959,298.

Young, Donald C., to Union Oil Company of California. Particulate high explosive of NH_4NO_3 - $CaSO_4$ - sensitizer. 3,959,044, Cl. 149-41.000.

Young, Henry Y.; and Henderson, Edward, deceased (by Henderson, Kathryn S., executrix), to Stiefel Laboratories, Inc. Stable human skin cosmetic composition containing milk. 3,959,491, Cl. 424-359.000.

Young, James Whitehurst, to Dresser Industries, Inc. Vacuum, vacuum-pressure, or pressure circulation bit having jet-assisted vacuum. 3,958,651, Cl. 175-340.000.

Young, John H., to Armstrong Cork Company. Cooling slide. 3,959,428, Cl. 264-145.000.

Yuhasz, Joseph M.: *See—*
Kelso, James W., 3,958,428.

Yurko, Joseph A., to Colgate-Palmolive Company. Biodegradable, non-polluting, heavy duty synthetic organic detergent composition. 3,959,165, Cl. 252-109.000.

Yusa, Haruhiko; Hashizume, Hideyuki; Oota, Masanori; Takahashi, Kazuo; and Chubachi, Susumu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Vinyl chloride resins blended with two step graft resins. 3,959,408, Cl. 260-876.00R.

Zaffrann, Albert A., Jr.; Borchardt, Robert E.; and Grabarczyk, Frank A., to Allen-Bradley Company. Trip mechanism for disconnect switch. 3,959,615, Cl. 200-153.00H.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*
Umezawa, Hamao; Maeda, Kenji; and Kondo, Shinichi, 3,959,257.

Zapomel, Johann, to Bizerba-Werke Wilhelm Kraut K.G. Slicing machine. 3,958,475, Cl. 83-112.000.

Zeblisky, Rudolph J.: *See—*
Schneble, Frederick W., Jr.; McCormack, John F.; and Zeblisky, Rudolph J., 3,959,531.

Zecchin, Alessandro: *See—*
Console, Luciano; Zecchin, Alessandro; and Quarta, Antonio, 3,959,240.

Zellmer, Wayne G.; and McGowan, Marvin E., to United States of America, Navy. Self-cocking rocket launcher detent. 3,958,490, Cl. 89-1.807.

Zellweger, Ltd.: *See—*
Felix, Ernst; and Locher, Hans, 3,958,305.

Zenith Radio Corporation: *See—*
Laub, Leonard J., 3,959,581.
Subramanian, Sundaram, 3,959,748.

Zerschling, Keith L.: *See—*
Olevsky, Benjamin; Layer, Jay W.; and Zerschling, Keith L., 3,959,601.

Zichis, Joseph, to Beckman Instruments, Inc. Diagnostic slide test for infectious mononucleosis. 3,959,456, Cl. 424-12.000.

Ziemer, Paul L.; Vetter, Richard J.; and Elle, Donald R., to Purdue Research Foundation. Microwave dosimeter utilizing thermoluminescent materials. 3,959,658, Cl. 250-484.000.

Zilch, Horst E.; and Fischer, Paul W., to Union Oil Company of California. Method of inhibiting scale for high temperature steam wells. 3,958,635, Cl. 166-244.00C.

Zinck-Petersen, Jorgen: *See—*
Lundquist, Bertil; Nilsson, Harald; and Zinck-Petersen, Jorgen, 3,959,145.

Zip Up, Inc.: *See—*
Campbell, Preston M., 3,958,376.

Zoglmeyr, Gunter, to Osterreichisch-Amerikanische Magnesit Aktiengesellschaft. Carbon impregnation of burned magnesite bricks. 3,959,532, Cl. 427-372.000.

Zollinger, Hans; and Honegger, Rolf, to Maschinenfabrik Ruti AG. Devices for insertion of filling yarn in a loom by means of a fluid. 3,958,609, Cl. 139-435.000.

Zollo, Corrado: *See—*
Edelman, Robert I.; Stockdale, Willis L.; Sylvester, Robert A.; and Zollo, Corrado, 3,958,870.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF MAY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Amoco Production Company: *See—*
Hunt, Elton B., Jr.; and Hujsak, Karol L., Re. 28,830.

Becka, Michael M.: *See—*
Kamborian, Jacob S., deceased; Godley, Lisbeth N., executrix; Becka, Michael M.; Kamborian, Jacob S., Jr., executors; Harriman, Allen C.; Jones, Geoffrey T.; and Vornberger, Karl F., Re. 28,825.

Becka, Michael M., deceased: *See—*
Harriman, Allen C., Re. 28,824.

Brown, Grayson, to Consolidated Foods Corporation. Electric motor winding. Re. 28,831, Cl. 310-194.000.

Canon Kabushiki Kaisha: *See—*
Komori, Shigehiro; Sato, Jiro; and Kurahashi, Akira, Re. 28,828.

Chesnokov, Alexandr Sergeevich: *See—*
Strelets, Khaim Lipovich; Chesnokov, Alexandr Sergeevich; Devyatkin, Vladimir Nikolaevich; Tatakin, Alexandr Nikolaevich; Krasikov, Evsei Dmitrievich; Leonova, Ljudmila Sergeevna; Medvetskaya, Galina Arkadievna; and Nechaeva, Tatyana Georgievna, Re. 28,829.

Consolidated Foods Corporation: *See—*
Brown, Grayson, Re. 28,831.

Devyatkin, Vladimir Nikolaevich: *See—*
Strelets, Khaim Lipovich; Chesnokov, Alexandr Sergeevich; Devyatkin, Vladimir Nikolaevich; Tatakin, Alexandr Nikolaevich; Krasikov, Evsei Dmitrievich; Leonova, Ljudmila Sergeevna; Medvetskaya, Galina Arkadievna; and Nechaeva, Tatyana Georgievna, Re. 28,829.

Dorey, Howard Anthony, to Mars, Inc. Method and apparatus for coin discrimination utilizing a coin impeller. Re. 28,827, Cl. 194-101.000.

Godley, Lisbeth N.: *See—*
Kamborian, Jacob S., deceased; Godley, Lisbeth N., executrix; Becka, Michael M.; Kamborian, Jacob S., Jr., executors; Harriman, Allen C.; Jones, Geoffrey T.; and Vornberger, Karl F., Re. 28,825.

Godley, Lisbeth N., executrix: *See—*
Kamborian, Jacob S., deceased; Godley, Lisbeth N., executrix; Becka, Michael M.; Kamborian, Jacob S., Jr., executors; Harriman, Allen C.; Jones, Geoffrey T.; and Vornberger, Karl F., Re. 28,825.

Godley, Lisbeth N., executrix, deceased: *See—*
Harriman, Allen C., Re. 28,824.

Goshy, Allyn N.; and Rehm, Russell L. Coulometric metering device. Re. 28,832, Cl. 324-94.000.

Harriman, Allen C., to Kamborian, Jacob S., deceased; Godley, Lisbeth N., executrix, deceased; Becka, Michael M., deceased; and Kamborian, executors; by Jacob S., Jr., deceased. Lasting apparatus with yieldable wiping means. Re. 28,824, Cl. 12-12.500.

Harriman, Allen C.: *See—*
Kamborian, Jacob S., deceased; Godley, Lisbeth N., executrix; Becka, Michael M.; Kamborian, Jacob S., Jr., executors; Harriman, Allen C.; Jones, Geoffrey T.; and Vornberger, Karl F., Re. 28,825.

Hujsak, Karol L.: *See—*
Hunt, Elton B., Jr.; and Hujsak, Karol L., Re. 28,830.

Hunt, Elton B., Jr.; and Hujsak, Karol L., to Amoco Production Company. Method for reducing sulfur compounds in sulfur plant effluent. Re. 28,830, Cl. 423-574.00R.

Jones, Geoffrey T.: *See—*
Kamborian, Jacob S., deceased; Godley, Lisbeth N., executrix; Becka, Michael M.; Kamborian, Jacob S., Jr., executors; Harriman, Allen C.; Jones, Geoffrey T.; and Vornberger, Karl F., Re. 28,825.

Kamborian, executors; by Jacob S., Jr., deceased: *See—*
Harriman, Allen C., Re. 28,824.

by Kamborian, Jacob S., deceased; by Godley, Lisbeth N., executrix; by Becka, Michael M.; by Kamborian, Jacob S., Jr., executors; Harriman, Allen C.; Jones, Geoffrey T.; and Vornberger, Karl F., to Godley, Lisbeth N.; Becka, Michael M.; and Kamborian, Jacob S., Jr., executors of the estate of Jacob S. Kamborian, deceased. Method and apparatus for use in lasting shoes. Re. 28,825, Cl. 12-145.000.

Kamborian, Jacob S., deceased: *See—*
Harriman, Allen C., Re. 28,824.

Kamborian, Jacob S., Jr.: *See—*
Kamborian, Jacob S., deceased; Godley, Lisbeth N., executrix; Becka, Michael M.; Kamborian, Jacob S., Jr., executors; Harriman, Allen C.; Jones, Geoffrey T.; and Vornberger, Karl F., Re. 28,825.

Kamborian, Jacob S., Jr., executors: *See—*
Kamborian, Jacob S., deceased; Godley, Lisbeth N., executrix; Becka, Michael M.; Kamborian, Jacob S., Jr., executors; Harriman, Allen C.; Jones, Geoffrey T.; and Vornberger, Karl F., Re. 28,825.

Komori, Shigehiro; Sato, Jiro; and Kurahashi, Akira, to Canon Kabushiki Kaisha. Electrophotographic copying device. Re. 28,828, Cl. 355-8.000.

Krasikov, Evsei Dmitrievich: *See—*
Strelets, Khaim Lipovich; Chesnokov, Alexandr Sergeevich; Devyatkin, Vladimir Nikolaevich; Tatakin, Alexandr Nikolaevich; Krasikov, Evsei Dmitrievich; Leonova, Ljudmila Sergeevna; Medvetskaya, Galina Arkadievna; and Nechaeva, Tatyana Georgievna, Re. 28,829.

Kurahashi, Akira: *See—*
Komori, Shigehiro; Sato, Jiro; and Kurahashi, Akira, Re. 28,828.

Ladney, Michael, Jr. Method of constructing mold for forming plastic foam. Re. 28,826, Cl. 29-428.000.

Leonova, Ljudmila Sergeevna: *See—*
Strelets, Khaim Lipovich; Chesnokov, Alexandr Sergeevich; Devyatkin, Vladimir Nikolaevich; Tatakin, Alexandr Nikolaevich; Krasikov, Evsei Dmitrievich; Leonova, Ljudmila Sergeevna; Medvetskaya, Galina Arkadievna; and Nechaeva, Tatyana Georgievna, Re. 28,829.

Mars, Inc.: *See—*
Fougere, Guy L., Re. 28,827.

Medvetskaya, Galina Arkadievna: *See—*
Strelets, Khaim Lipovich; Chesnokov, Alexandr Sergeevich; Devyatkin, Vladimir Nikolaevich; Tatakin, Alexandr Nikolaevich; Krasikov, Evsei Dmitrievich; Leonova, Ljudmila Sergeevna; Medvetskaya, Galina Arkadievna; and Nechaeva, Tatyana Georgievna, Re. 28,829.

Nechaeva, Tatyana Georgievna: *See—*
Strelets, Khaim Lipovich; Chesnokov, Alexandr Sergeevich; Devyatkin, Vladimir Nikolaevich; Tatakin, Alexandr Nikolaevich; Krasikov, Evsei Dmitrievich; Leonova, Ljudmila Sergeevna; Medvetskaya, Galina Arkadievna; and Nechaeva, Tatyana Georgievna, Re. 28,829.

Rehm, Russell L.: *See—*
Goshy, Allyn N.; and Rehm, Russell L., Re. 28,832.

Sato, Jiro: *See—*
Komori, Shigehiro; Sato, Jiro; and Kurahashi, Akira, Re. 28,828.

Solartron Electronic Group Limited, The: *See—*
Dorey, Howard Anthony, Re. 28,833.

Strelets, Khaim Lipovich; Chesnokov, Alexandr Sergeevich; Devyatkin, Vladimir Nikolaevich; Tatakin, Alexandr Nikolaevich; Krasikov, Evsei Dmitrievich; Leonova, Ljudmila Sergeevna; Medvetskaya, Galina Arkadievna; and Nechaeva, Tatyana Georgievna. Fused salt electrolyzer for magnesium production. Re. 28,829, Cl. 204-244.000.

Tatakin, Alexandr Nikolaevich: *See—*
Strelets, Khaim Lipovich; Chesnokov, Alexandr Sergeevich; Devyatkin, Vladimir Nikolaevich; Tatakin, Alexandr Nikolaevich; Krasikov, Evsei Dmitrievich; Leonova, Ljudmila Sergeevna; Medvetskaya, Galina Arkadievna; and Nechaeva, Tatyana Georgievna, Re. 28,829.

Vornberger, Karl F.: *See—*
Kamborian, Jacob S., deceased; Godley, Lisbeth N., executrix; Becka, Michael M.; Kamborian, Jacob S., Jr., executors; Harriman, Allen C.; Jones, Geoffrey T.; and Vornberger, Karl F., Re. 28,825.

LIST OF PLANT PATENTEES

Hines, James W., Jr., to Hines Wholesale Nurseries. Azalea plant. 3,891, 5–25–76, Cl. 56.

Hines, James W., Jr., to Hines Wholesale Nurseries. Azalea plant. 3,894, 5–25–76, Cl. 56.

Hines Wholesale Nurseries: *See—*
Hines, James W., Jr. 3,891.
Hines, James W., Jr. 3,894.
Lammerts, Walter E. 3,892.
Lammerts, Walter E. 3,893.
Lammerts, Walter E. 3,895.

Lammerts, Walter E., to Hines Wholesale Nurseries. Lilac plant. 3,892, 5–25–76, Cl. 66.

Lammerts, Walter E., to Hines Wholesale Nurseries. Lilac plant. 3,893, 5–25–76, Cl. 66.

Lammerts, Walter E., to Hines Wholesale Nurseries. Lilac plant. 3,895, 5–25–76, Cl. 66.

LIST OF DESIGN PATENTEES

ACF Industries Inc.: *See*—
Kemp, Willard E., and Palmer. 240,037.
Addressograph-Multigraph Corp.: *See*—
Brown, Edward L. 240,080.
Greene, Robert L., and Olson. 240,048.
Akro-Medic Engineering, Inc.: *See*—
Varga, John M. 240,052.
American Optical Corp.: *See*—
Shindler, Anthony. 240,077.
Shindler, Anthony. 240,079.
Arts, Kenneth W., to Koszegi Leather & Vinyl Products, Inc. Belt-attachable carrying case. 239,985, 5–25–75, Cl. D2—400.
Arts, Kenneth W., to Kosegi Leather & Vinyl Products, Inc. Belt-attachable carrying case. 239,986, 5–25–76, Cl. D2—400.
Barbara, William B., Sr. Picture frame. 239,998, 5–25–76, Cl. D6—242.
Baxter Laboratories, Inc.: *See*—
Reisdorf, Dennis J. 240,085.
Becker, Harold W.: *See*—
Glassner, E. Donald, and Becker. 240,072.
Bizovi, Dan D. Golf club head. 240,058, 5–25–76, Cl. D34—5
Breger, Carl-Arne, to Sandvik Aktiebolag. Hack saw. 240,009 5–25–76, Cl. D8—96.
Brown, Edward L., to Addressograph-Multigraph Corp. Duplicating machine. 240,080, 5–25–76, Cl. D61—1.
Buckley, Babe. Painting mounting clip. 240,015, 5–25–76, Cl. D8—258.
Burin, Ralph R., and Harold Stelicha, to Intercraft Industries Corp. Photo frame. 239,997, 5–25–76, Cl. D6—236.
Cardenas, Gregorio B. Impression frame for making tile-simulating impressions in wet cement. 240,006, 5–25–76, Cl. D8—45.
Cardenas, Gregorie B. Impression frame for making tile-simulating impressions in wet cement. 240,007, 5–25–76, Cl. D8—45.
Carre, Alain, to Waterman S.A. Cigarette lighter. 240,050, 5–25–76, Cl. D27—39.
Christian, Hubert E., to Dart Industries, Inc. Dish. 239,999, 5–25–76, Cl. D7—23.
Citic Industries: *See*—
Skottheim, Leif H. 239,982.
Clairol Inc.: *See*—
Rawson, Paul O. 240,087.
Rawson, Paul O. 240,089.
Colani, Luigi, to Dansk Pressalit A/S. Combined toilet seat and cover. 240,038, 5–25–76, Cl. D23—71.
Cone, Richard E. II, and R. A. Hasenstab. Feeding dish. 240,000. 5–25–76, Cl. D7—24.
Continental Can Co., Inc.: *See*—
Newman, Fred C. 240,020.
Corning Glass Works: *See*—
Lawhead, Creighton M. 240,021.
Mercadante, Ottorino N. 240,002.
Crealock, William I. B. Boat. 240,029, 5–25–76, Cl. D12—64.
Creco, Vincent. Latch for rolling metal gates. 240,011, 5–25–76, Cl. D8—127.
Crenshaw, John C.: *See*—
Danz, Ellworth R., and Crenshaw. 240,023.
Crossbow Inc.: *See*—
Trott, David H. 240,017.
Curd, Robert F., Jr. Buoy. 240,025, 5–25–76, Cl. D10—107.
Custom Raduis Corp.: *See*—
Humphreys, Donald R. 240,005.
Dansk Pressalit A/S: *See*—
Colani, Luigi. 240,038.
Danz, Ellworth R., and J. C. Crenshaw, to General Time Corp. Digital clock. 240,023, 5–25–76, Cl. D10—15.
Dart Industries, Inc.: *See*—
Christian, Hubert E. 239,999.
Davis, John J.: *See*—
Riblett Edward L., and Davis. 240,086.
Davis, Linda K. Hair teasing comb. 240,088, 5–25–76, Cl. D86—8.
Dietrich, John P., to Sperry Rand Corp. Indicator pointer for flight instrument. 240,028, 5–25–76, Cl. D10—127.
Dittert, Karl, to Giroflex-Entwicklungs-AG. Chair or similar article. 239,988, 5–25–76, Cl. D6—31.
Ebbinghaus, Warren W. Cord wood splitter. 240,073, 5–25–76, Cl. D55—1.
Edwards, Lawrence K. Station for elevated railway. 240,030, 5–25–76, Cl. D13—1.
Fitzsimonds, George R., to General Electric Co. Electric shave cream dispenser. 239,994, 5–25–76, Cl. D6—95.
Fortune, William S. Miniature vacuum cleaning tool or the like. 240,008, 5–25–76, Cl. D8—51.
G.A.C. International, Inc.: *See*—
Kawaguchi, Kozo. 240,039–45.
Gabourie, Gregory S. Armchair or similar article. 239,992, 5–25–76, Cl. D6—78.
Galrard, Jacques, to SEB. Yoghurt making appliance. 240,003, 5–25–76, Cl. D7—96.
Gallo, George T. Toothbrush guard and support. 239,987, 5–25–76, Cl. D4—24.
Garaventa, Joseph H., to Harrah's Club. Game chip. 240,053, 5–25–76, Cl. D34—5.
Garwood, Donald C., to Merck & Co., Inc. Lamp for hardening an orthopedic cast. 240,082, 5–25–76, Cl. D83—1.
General Electric Co.: *See*—
Fitzsimonds, George R. 239,994.
Wilkes, Kenneth R. 240,075.
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12R 3,959,030
26 3,959,031
105 3,959,032
112 3,959,033
113 3,959,034
134 3,959,035
171 3,959,036
3,959,037
3,959,038
175 3,959,039
186 3,959,040

CLASS 149

2 3,959,041
19.92 3,959,042
22 3,959,043
41 3,959,044

CLASS 150

30 3,958,616

CLASS 152

241 3,958,617

CLASS 156

3 3,959,045
7 3,959,046
8 3,959,047
79 3,959,049
3,959,050
85 3,959,051
86 3,959,052
94 3,959,048
123 3,959,053
148 3,959,054
167 3,959,055
197 3,959,056
244 3,959,057
3,959,059
245 3,959,060
262 3,959,061
272 3,959,058
313 3,959,062
325 3,959,063
417 3,959,064
423 3,959,065
459 3,959,066

CLASS 157

1.2 3,958,618

CLASS 159

17R 3,959,067

CLASS 162

17 3,959,068

CLASS 164

131 3,958,619
133 3,958,620
173 3,958,621
276 3,958,622
412 3,958,623

CLASS 165

1 3,958,624
2 3,958,625
8 3,958,626
32 3,958,627
35 3,958,628
74 3,958,629
161 3,958,630
166 3,958,631

CLASS 166

85 3,958,632
117.5 3,958,633
233 3,958,634
244C 3,958,635
248 3,958,636
287 3,958,637
294 3,958,638
3,958,639
312 3,958,641
315 3,958,640
3,958,642

CLASS 169

43 3,958,643
56 3,958,644

CLASS 173

17 3,958,645
44 3,958,646
127 3,958,647

CLASS 174

15BH 3,959,576
50.5 3,959,577
65R 3,959,578
68.5 3,959,579

CLASS 175

21 3,958,648
61 3,958,649
205 3,958,650
340 3,958,651

CLASS 176

19LD 3,959,069
30 3,959,070
36R 3,959,071
3,959,072
85 3,959,073

CLASS 178

6.5 3,959,580
6.6R 3,959,581
6.8 3,959,582
7.3D 3,959,583
7.88 3,959,584
18 3,959,585
66R 3,959,586
69.5R 3,959,587
3,959,588
3,959,589
3,959,601

CLASS 179

1GQ 3,959,590
1.5E 3,959,592
6R 3,959,591
8A 3,959,593
15AQ 3,959,594
15AT 3,959,596
15BA 3,959,595
15.55T 3,959,597
16EC 3,959,598
18BE 3,959,600
18EB 3,959,599
81R 3,959,602
84VF 3,959,603
3,959,604
175.3R 3,959,605
175.31R 3,959,606
183 3,959,607

CLASS 180

1VS 3,958,652
64R 3,958,654
66A 3,958,655
79.1 3,958,656
82C 3,958,658
89A 3,958,659
133 3,958,657
157 3,958,653

CLASS 181

57 3,958,660
117 3,958,661
171 3,958,662

CLASS 184

6.4 3,958,663

CLASS 187

8.47 3,958,664
8.75 3,958,665

CLASS 188

1A 3,958,666
73.3 3,958,667
73.4 3,958,668
165 3,958,669
196R 3,958,670
274 3,958,671
277 3,958,672
322 3,958,673
340 3,958,674

CLASS 190

43 3,958,675
49 3,958,676

CLASS 191

12.2R 3,959,608

CLASS 192

3R 3,958,677
44 3,958,678
45 3,958,679
48.5 3,958,680
88B 3,958,681

CLASS 194

101 Re.28,827

CLASS 195

1.1 3,959,074
29 3,959,075
30 3,959,076
63 3,959,077
3,959,078
3,959,079
3,959,080
103.5R 3,959,081
141 3,959,120

CLASS 198

19 3,958,682
22R 3,958,683
127R 3,958,684
179 3,958,685
189 3,958,686
220BA 3,958,687
249 3,958,688

CLASS 200

4 3,959,609
5A 3,959,610
3,959,611
11R 3,959,612
44 3,959,613
47 3,959,614
153H 3,959,615
254 3,959,616
305 3,959,617
339 3,959,618

CLASS 201

1 3,959,082
39 3,959,083
3,959,084

CLASS 202

154 3,959,085
262 3,959,086

CLASS 204

1T 3,959,087
14R 3,959,088
26 3,959,089
28 3,959,090
38A 3,959,091
39 3,959,092
72 3,959,093
77 3,959,094
98 3,959,095
107 3,959,096
108 3,959,097
129.3 3,959,098
146 3,959,099
159.11 3,959,101
159.13 3,959,102
159.15 3,959,100
159.19 3,959,103
164 3,959,104
165 3,959,105
181 3,959,106
195G 3,959,107
195R 3,959,108
212 3,959,109
229 3,959,110
244 Re.28,829
258 3,959,111
273 3,959,112
278 3,959,113
297W 3,959,114

CLASS 206

104 3,958,689
232 3,958,690
326 3,958,691
359 3,958,692
455 3,958,693

CLASS 208

53 3,959,115
66 3,959,116
113 3,959,117
120 3,959,118
127 3,959,119
139 3,959,121
143 3,959,122

CLASS 209

211 3,959,123

CLASS 210

6 3,959,124
10 3,959,125
3,959,126
11 3,959,127
24 3,959,128
28 3,959,129
37R 3,959,130
44 3,959,131
45 3,959,132
3,959,133
59 3,959,134
77 3,959,135
83 3,959,136
84 3,959,137
94 3,959,138
97 3,959,139
107 3,959,140
132 3,959,141
170 3,959,142
196 3,959,143
201 3,959,144
223 3,959,145
257M 3,959,146
323T 3,959,147
334 3,959,148
512M 3,959,150
528 3,959,151
530 3,959,152

CLASS 211

4 3,958,694
37 3,958,695
45 3,958,696
54 3,958,697

CLASS 214

1P 3,958,698
23 3,958,699
35R 3,958,700
38CA 3,958,702
38C 3,958,701
75G 3,958,703
130C 3,958,704
152 3,958,705
3,958,706
390 3,958,707

CLASS 215

216 3,958,708
221 3,958,709
254 3,958,710

CLASS 217

26.5 3,958,711
40 3,958,712

CLASS 219

50 3,959,619
386 3,959,620
501 3,959,621
549 3,959,622

CLASS 220

6 3,958,713
10 3,958,714
22 3,958,715
85P 3,958,716
268 3,958,717
273 3,958,718
288 3,958,719

CLASS 221

93 3,958,720

CLASS 222

107 3,958,721
195 3,958,722
282 3,958,723
318 3,958,724
335 3,958,725
402.13 3,958,726
402.24 3,958,727
519 3,958,728
539 3,958,729
559 3,958,730

CLASS 224

58 3,958,731

CLASS 225

2 3,958,732
3,958,733

CLASS 226

1 3,958,734
3,958,735
3 3,958,736
142 3,958,737

CLASS 227

109 3,958,738

CLASS 228

44.1R 3,958,739
102 3,958,740
122 3,958,741
123 3,958,742
226 3,958,743

CLASS 229

6R 3,958,744
15 3,958,745
38 3,958,746
43 3,958,747
51TC 3,958,748
55 3,958,749
56 3,958,750
87F 3,958,751

CLASS 232

35 3,958,752

CLASS 233

23R 3,958,753

CLASS 235

61.11E 3,959,624
3,959,625
3,959,627
3,959,628
61.11R 3,959,623
3,959,626
61.12N 3,959,629
3,959,630
3,959,631
92AC 3,959,632
92PD 3,959,634
92T 3,959,633
151 3,959,640
151.1 3,959,635
151.33 3,959,636
152 3,959,637
153AK 3,959,638
164 3,959,639
181 3,959,641

CLASS 237

1R 3,958,754
8R 3,958,755

CLASS 239

102 3,958,756
125 3,958,757
133 3,958,758
434 3,958,759
453 3,958,760
542 3,958,761
552 3,958,762

CLASS 240

2LC 3,959,642
41.35R 3,959,643
47 3,959,644
84 3,959,645

CLASS 241

54 3,958,763
74 3,958,764
99 3,958,765
101.2 3,958,766
101.7 3,958,767

CLASS 242

1 3,958,768
84.1L 3,958,770
84.1R 3,958,769
84.5R 3,958,771
86.5R 3,958,772
107.4A 3,958,774
107.4R 3,958,773
118.32 3,958,776
118.8 3,958,775
182 3,958,777
222 3,958,778

CLASS 244

75R 3,958,779
152 3,958,780

CLASS 246

34R 3,958,781
40 3,958,782
182 3,958,783

CLASS 248

63 3,958,784
97 3,958,785
176 3,958,786
183 3,958,787
214 3,958,788
340 3,958,789

CLASS 249

65 3,958,790

CLASS 250

211J 3,959,646
258 3,959,647
262 3,959,648
299 3,959,649
303 3,959,650
310 3,959,651
363S 3,959,652
374 3,959,653
468 3,959,654
474 3,959,655
476 3,959,656
3,959,657
484 3,959,658
501 3,959,659
504 3,959,660
531 3,959,661

CLASS 251

129 3,958,791
304 3,958,792

CLASS 252

1 3,959,154
8.55E 3,959,158
8.8 3,959,155
3,959,156
3,959,157
33 3,959,164
51.5A 3,959,159
56S 3,959,187
59 3,959,161
62.1P 3,959,153
63.7 3,959,162
90 3,959,160
99 3,959,163
109 3,959,165
146 3,959,166
180 3,959,167
3,959,168
182 3,959,169
189 3,959,170
300 3,959,171
301.1W 3,959,172
309 3,959,173
317 3,959,174
321 3,959,175
352 3,959,176
389A 3,959,177
430 3,959,178
455Z 3,959,179
3,959,180
459 3,959,181
467 3,959,182
477R 3,959,183
521 3,959,184
522 3,959,185
551 3,959,186

CLASS 254

10B 3,958,793

CLASS 256

34 3,958,794

CLASS 259

2 3,958,795

CLASS 260

2.5AD 3,959,191
2.5HB 3,959,190
2.5B 3,959,189
2.5E 3,959,197
2.5P 3,959,188
2.5R 3,959,192
15 3,959,193
17.2 3,959,194
17.3 3,959,195
18EP 3,959,196
23.7A 3,959,198
28.5R 3,959,199
29.1SB 3,959,200
3,959,203
29.4UA 3,959,202
29.4R 3,959,201
29.6RW 3,959,205
3,959,206
29.7PT 3,959,204
29.7E 3,959,207
38 3,959,208
40R 3,959,209
42.13 3,959,210
42.18 3,959,211
42.53 3,959,212
45.7P 3,959,213
45.75B 3,959,216
3,959,217
3,959,219
45.75N 3,959,218
3,959,220
45.8NZ 3,959,215
45.8N 3,959,214
45.95D 3,959,221
47EP 3,959,222
47C 3,959,350
47R 3,959,223
63R 3,959,224
3,959,225
67TN 3,959,227
75H 3,959,229
75R 3,959,230
75T 3,959,228
3,959,231
77.5R 3,959,149
3,959,233
78UA 3,959,234
78R 3,959,232
79.3M 3,959,236
112R 3,959,246
112.5TR 3,959,247
3,959,248
112.5R 3,959,245
122 3,959,249
156 3,959,250
209R 3,959,251
210AB 3,959,252
3,959,254
3,959,255
3,959,256
210R 3,959,253
211.5R 3,959,257
239.1 3,959,258
3,959,259
239.5 3,959,260
239.6 3,959,261
240G 3,959,262
240R 3,959,263
3,959,264
242 3,959,265
243A 3,959,268
243C 3,959,266
3,959,267
244R 3,959,270

247.1B 3,959,271
247.2B 3,959,272
247.7L 3,959,274
247.7S 3,959,273
248AS 3,959,275
248.5 3,959,276
250BC 3,959,277
251.5 3,959,278
256.4Q 3,959,279
256.5R 3,959,280
268BC 3,959,281
3,959,283
3,959,284
268TR 3,959,282
281NH 3,959,285
3,959,286
285 3,959,287
285.5 3,959,288
287CF 3,959,289
293.55 3,959,290
293.66 3,959,291
293.69 3,959,292
293.76 3,959,293
293.88 3,959,294
293.89 3,959,295
3,959,298
294.8G 3,959,296
294.9 3,959,297
295AM 3,959,299
296P 3,959,300
302D 3,959,301
306.7C 3,959,302
306.8D 3,959,303
307FA 3,959,304
309 3,959,305
309.2 3,959,306
309.5 3,959,307
310R 3,959,308
315 3,959,309
326.29 3,959,312
326.5FL 3,959,311
326.9 3,959,310
327C 3,959,313
332.2A 3,959,314
343.3R 3,959,269
346.2M 3,959,315
348.5R 3,959,316
369 3,959,317
3,959,318
390 3,959,319
397.2 3,959,320
397.4 3,959,322
398.5 3,959,321
402.5 3,959,323
429.7 3,959,324
438.1 3,959,325
439R 3,959,326
448.8R 3,959,327
453AR 3,959,329
453RW 3,959,328
454 3,959,330
455A 3,959,331
456A 3,959,332
3,959,333
459R 3,959,334
463 3,959,335
465C 3,959,336
3,959,337
3,959,339
465E 3,959,338
465K 3,959,340
465.3 3,959,341
465.5A 3,959,342
465.5R 3,959,343
3,959,344
465.8R 3,959,345
468D 3,959,346
468K 3,959,347
471C 3,959,348
473A 3,959,349
477 3,959,351
479R 3,959,352
3,959,353
3,959,354
482R 3,959,355
3,959,356
486R 3,959,357
3,959,358
501.18 3,959,359
502.4A 3,959,360
502.5 3,959,361
513R 3,959,362
514D 3,959,363
515R 3,959,364
534L 3,959,365
543R 3,959,366
544Y 3,959,367
552SC 3,959,368
553R 3,959,369
558D 3,959,370
561B 3,959,373
561H 3,959,372
561R 3,959,371
563B 3,959,374
563R 3,959,375
567.6M 3,959,376
576 3,959,377
584R 3,959,378
3,959,379
586P 3,959,382
586R 3,959,380
3,959,381
603C 3,959,383
604HF 3,959,385
3,959,386
604R 3,959,384
612R 3,959,387
613D 3,959,388
615B 3,959,389
3,959,391
615R 3,959,390
621G 3,959,393
621H 3,959,392
621R 3,959,394
622R 3,959,395
632R 3,959,396
650R 3,959,398
652.5R 3,959,397
671C 3,959,399
671R 3,959,226
683R 3,959,401
683.15R 3,959,400
683.48 3,959,402
825 3,959,403
830TW 3,959,404
836 3,959,405
874 3,959,406
876R 3,959,407
3,959,408
878B 3,959,409
878R 3,959,410
880B 3,959,412
880R 3,959,411
927R 3,959,413
928 3,959,414
3,959,415
940 3,959,416

CLASS 261
39B 3,959,417
50R 3,959,418
98 3,959,419
112 3,959,420

CLASS 264
6 3,959,421
23 3,959,422
34 3,959,423
45.8 3,959,434
88 3,959,424
89 3,959,425
94 3,959,426
99 3,959,427
145 3,959,428
155 3,959,429
157 3,959,430
171 3,959,431
3,959,432
328 3,959,433

CLASS 266
123 3,958,796

CLASS 269
302.1 3,958,797

CLASS 270
52.5 3,958,798
68A 3,958,799

CLASS 271
126 3,958,800

CLASS 272
63 3,958,801
74 3,958,802
135 3,958,803

CLASS 273
6 3,958,804
73G 3,958,805
85C 3,958,806
159 3,958,807

CLASS 277
1 3,958,808

CLASS 279
1L 3,958,809

CLASS 280
269 3,958,814
610 3,958,810
618 3,958,811
746 3,958,812
755 3,958,813

CLASS 282
27.5 3,958,815

CLASS 283
38 3,958,816

CLASS 285
16 3,958,817
92 3,958,818
302 3,958,819

CLASS 290
38R 3,959,662
53 3,959,663

CLASS 292
92 3,958,820
97 3,958,821
113 3,958,822
226 3,958,823

CLASS 294
67DA 3,958,824
78R 3,958,825

CLASS 296
3,958,826

CLASS 297
61 3,958,827
355 3,958,828

CLASS 298
23B 3,958,829

CLASS 299
31 3,958,830
64 3,958,831
89 3,958,832

CLASS 301
6A 3,958,833

CLASS 303
21BE 3,958,834
21P 3,958,835
22R 3,958,838

CLASS 305
14 3,958,836
21 3,958,837
35R 3,958,839

CLASS 307
95 3,959,664
208 3,959,665
3,959,666
235T 3,959,667
252G 3,959,668
262 3,959,669
268 3,959,670
270 3,959,671

CLASS 308
2A 3,958,840
3.5 3,958,841
10 3,958,842
24 3,958,844
65 3,958,845
149 3,958,846
152 3,958,843
196 3,958,847

CLASS 310
36 3,959,672
38 3,959,673
49R 3,959,674
68C 3,959,675
68D 3,959,676
90 3,959,677
172 3,959,678
194 Re.28,831
232 3,959,679

CLASS 313
95 3,959,680
188 3,959,681
217 3,959,682
218 3,959,683
318 3,959,684
330 3,959,685
450 3,959,686

CLASS 315
5.42 3,959,687
240 3,959,688
370 3,959,689

CLASS 316
26 3,958,848

CLASS 317
4 3,959,690
13B 3,959,691
3,959,692
18D 3,959,693
18R 3,959,694
33R 3,959,695
62 3,959,696
151 3,959,697

CLASS 318
6 3,959,698
45 3,959,699
138 3,959,700
139 3,959,701
181 3,959,702
305 3,959,703
387 3,959,704
439 3,959,705

CLASS 320
2 3,959,706
39 3,959,707
48 3,959,708

CLASS 321
7 3,959,709
9A 3,959,710
18 3,959,711
56 3,959,712

CLASS 323
9 3,959,713
17 3,959,714
19 3,959,715
20 3,959,716
22Z 3,959,717
48 3,959,718
102 3,959,719
3,959,720

CLASS 324
6 3,959,721
16S 3,959,725
28CB 3,959,722
61P 3,959,723
94 Re.28,832
142 3,959,724

CLASS 325
38A 3,959,726
390 3,959,727
422 3,959,728
455 3,959,729

CLASS 328
63 3,959,730
129 3,959,731
151 3,959,732

CLASS 330
30D 3,959,733
33 3,959,734
207P 3,959,735
3,959,736

CLASS 331
1A 3,959,737
94.5C 3,959,738
3,959,739
94.5G 3,959,741
94.5Q 3,959,740
111 3,959,742
3,959,743
116R 3,959,744

CLASS 332
11D 3,959,745

CLASS 333
17M 3,959,746
30R 3,959,747
72 3,959,748
73R 3,959,749
97S 3,959,750

CLASS 335
3 3,959,751
10 3,959,752
16 3,959,753
35 3,959,754
63 3,959,755
139 3,959,756
147 3,959,757
153 3,959,758
203 3,959,759

CLASS 336
84 3,959,760
3,959,761

CLASS 337
102 3,959,762

CLASS 338
21 3,959,763
34 3,959,764
3,959,765

CLASS 339
14P 3,958,849
22 3,958,850
47R 3,958,851
91P 3,958,852
99R 3,958,853
111 3,958,854
3,958,855
113R 3,958,856
128 3,958,857
186M 3,958,858
217S 3,958,859

CLASS 340
3E 3,959,766
18P 3,959,767
82 3,959,768
146.1E 3,959,770
146.3SY 3,959,769
146.3H 3,959,771
167A 3,959,772
172.5 3,959,773
3,959,774
3,959,775
3,959,776
3,959,777
3,959,778
3,959,779
3,959,780
173BB 3,959,783
173CA 3,959,782
173LM 3,959,784
173R 3,959,781
174TF 3,959,785
210 3,959,786
227R 3,959,787
237S 3,959,788
280 3,959,789
3,959,790
324R 3,959,791
347NT Re.28,833

CLASS 343
6.5SS 3,959,792
6.5R 3,959,793
701 3,959,794
883 3,959,795
909 3,959,796

CLASS 346
1 3,959,797
74.1 3,959,798
135 3,959,799

CLASS 350
3.5 3,958,860
96C 3,958,861
160R 3,958,862
161 3,958,863
189 3,958,864
214 3,958,865
3,958,866

CLASS 351
47 3,958,867

CLASS 352
27 3,958,868
35 3,958,869
37 3,958,870
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89	3,959,522	430	3,959,564		3,959,546	379	3,959,558	478	3,959,570	250	3,958,923
98	3,959,523	CLASS 428		172	3,959,572	394	3,959,559	537	3,959,571	258	3,958,924
106	3,959,524	5	3,959,535	209	3,959,547		3,959,560	CLASS 431			
185	3,959,525	8	3,959,536	212	3,959,548	412	3,959,561	9	3,958,915	CLASS 526	
209	3,959,526	31	3,959,537	213	3,959,549	423	3,959,562	170	3,958,916	9	3,959,242
259	3,959,527		3,959,538	220	3,959,550	425	3,959,573	289	3,958,917	16	3,959,237
290	3,959,528	35	3,959,539	272	3,959,551		3,959,574	CLASS 432		25	3,959,239
335	3,959,529		3,959,540	290	3,959,552	429	3,959,563	2	3,958,918	62	3,959,235
341	3,959,530	36	3,959,541	329	3,959,553	432	3,959,565	14	3,958,919	84	3,959,244
345	3,959,531	44	3,959,542	336	3,959,554	446	3,959,566	23	3,958,920	232	3,959,241
372	3,959,532	66	3,959,543	349	3,959,555	461	3,959,567	122	3,958,921	281	3,959,238
386	3,959,533	109	3,959,544	364	3,959,556	462	3,959,568	222	3,958,922	341	3,959,240
390	3,959,534	141	3,959,545	368	3,959,557	475	3,959,569			494	3,959,243

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	310	239,983	36	240,002	253	240,020	D23—	17	240,036	D32—	2C	240,052	D48—	20R	240,070
	347	239,984	96	240,003	285	240,021		19	240,037	D34—	5CB	240,059		23	240,071
	400	239,985	156	240,004	288	240,022		71	240,038		GH	240,054	D55—	1A	240,073
		239,986	D8—	32	240,005	D10—	15	240,023	D24—	1C	240,039		240,058		C	240,072
D4—	24	239,987	45	240,006	57	240,024			240,040			240,060			F	240,074
D6—	31	239,988		240,007	107	240,025			240,041		GP	240,053	D56—	4B	240,076
	48.1	239,989	51	240,008	126	240,026			240,042		SP	240,055		R	240,075
	57	239,990	96	240,009		240,027			240,043		SS	240,057	D70—	2B	240,081
	78	239,992	107	240,010	127	240,028			240,044		M	240,056	D83—	1C	240,082
	85	239,991	127	240,011	D12—	64	240,029		240,045		15LL	240,063			240,083
		239,993	178	240,012	D16—	27	240,080	D25—	4	240,030		240,065			240,084
	95	239,994	208	240,013		65	240,077		22	240,031		R 240,061		U	240,085
	166	239,995	233	240,014			240,079	D26—	1R	240,046		240,062	D86—	8	240,088
	194	239,996	258	240,015		70	240,078		5C	240,048		240,064		10A	240,086
	236	239,997	D9—	10	240,016	D19—	49	240,032		14J	240,047		240,066		E	240,087
	242	239,998		59	240,017		92	240,033	D27—	6	240,049	D35—	3B 240,067			240,089
D7—	23	239,999		119	240,018	D22—	19	240,034		39	240,050		240,068	D87—	3F	240,090
	24	240,000														

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42 : 239,996
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44 : 240,054
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Plant Patents

6 : 3,891 | 3,892 | 3,893 | 3,894 | 3,895 |

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